

CLIMATE
CHANGE
2019

GLOBAL OBSERVATORY
**ON NON-STATE
CLIMATE ACTION**

LOCAL ACTION BOOK

An aerial photograph of a residential neighborhood with various colored roofs and green spaces, overlaid with a semi-transparent blue band containing the title text.

SYNTHESIS REPORT ON CLIMATE ACTION
BY LOCAL AND SUBNATIONAL
GOVERNMENTS



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Photo by Max Bottinger on Unsplash

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PRÉSENTATION

Climate Chance Association

Since 2015, the Climate Chance Association is participating in the mobilization against climate change. It is the only international organisation that aims to bring together all the non-state actors recognized by the UN (the 9 groups of actors: local authorities, companies, NGOs, trade unions, scientific community, agricultural, youth, indigenous peoples and women organisations), to develop common priorities and proposals and to strengthen stakeholders dynamics through networking (thematic coalitions, summits, action portal).

The Observatory and the Sector-Based Book

In order to strengthen the action of non-state actors and give credibility to climate stabilisation scenarios, the Climate Chance Association launched in 2018 a Global Observatory of Non-State Climate Action, which aims to explain the evolution of greenhouse gas emissions, by crossing national public policies, with sectoral dynamics, strategies of private actors, local public policies, and all the actions undertaken by non-state actors at the local level.

In this book, we synthesize the elements of evaluation and assessment from members of the main local and subnational networks engaged in fighting climate change (Section I), we propose 13 new case studies of cities and regions analyzing the alignment of their local public policies (Section II), and finally we offer an illustrative and interactive global overview of local public policies led in 2019 through 80 short illustrations (Section III).

The Climate Chance Association and its Observatory are supported by



INTRODUCTION

- # Global trends & context 2019



Local and subnational governments have demonstrated in 2019 an escalation of political and technical contributions to the global efforts in the fight against climate change.

Over 1,180 local governments, representing 290 million inhabitants, have recognised, acknowledged or declared a “climate emergency” by way of a formal binding resolution ([CEDEMIA](#), 2019), including 467 Quebecois cities, major cities such as Sydney, Dublin, Paris, Milan, Praha, etc. German cities addressed an open letter to the Chancellor, Angela Merkel, to seek support from the State to implement measures required by the “climate emergency” ([ICLEI](#), 2019). In addition, 16% of the global GDP is covered by net zero emissions targets set by nations, regions and cities (Energy and Climate Intelligence Unit - [ECIU](#)). In Europe, mayors from 210 cities, representing 62 million EU citizens, have issued in May 2019 an open letter calling for the European Council to commit to a new long-term climate strategy including the achievement of net-zero emissions by 2050 (which EU leaders failed to adopt in June), and the end of fossil fuel subsidies ([CitiesToday](#), 2019).

The growing amounts of research and studies related to urban and climate issues, as well as the multiplication of grassroots movements, contribute to bringing climate issues into communities and local political affairs.

By 2050, 77% of cities are highly likely to experience the temperature and rainfall patterns now associated with equatorial regions and 22% are projected to suffer conditions never seen before in any city on Earth ([Bastin, F et al.](#), 2019). Thus, Madrid’s climate could resemble Marrakech’s climate today, Stockholm will resemble Budapest, etc. Despite the political leadership of the Global North cities to pursue the transition, the disruption of basic social and economic activities will have the most extreme consequences for a large share of the population in the Global South ([IPCC](#), 2018). In parallel, populations are raising their concern across the globe and have pressured national and local governments to take bold action, from mere demonstrations to civil disobedience. Grassroot movements, like Fridays for Future (schools strike movement) or wider movements such as Sunrise Movement or Extinction Rebellion, now count [groups on every continent](#), making climate change one of the main thrusts of election campaigns.

Subnational governments' leadership is driven by the increasingly apparent interstice between the climate (mitigation and adaptation) and development agendas within urban areas.

The importance of a human scale-based urban planning is illustrated by several pieces of data: 70% of the global population is expected to be living in urban areas by 2050 ([World Bank](#), 2019); cities account for 70% of the global CO₂ emissions ([C40](#)); 90% of people worldwide breathe polluted air (WHO, 2018); and 1 billion people live in slum conditions (UN-Habitat), etc.

The trajectory of 3 major trends needs to change significantly in urban areas to reach the targets outlined in the Paris Agreement, Sustainable Development Goals and the New Urban Agenda (fig. 1): contain urban sprawl, secure decent housing for slum dwellers and reduce carbon emissions to net zero.

Many studies thus place cities at the core of country's GHG emissions reduction strategies and Nationally Determined Contributions (NDCs).

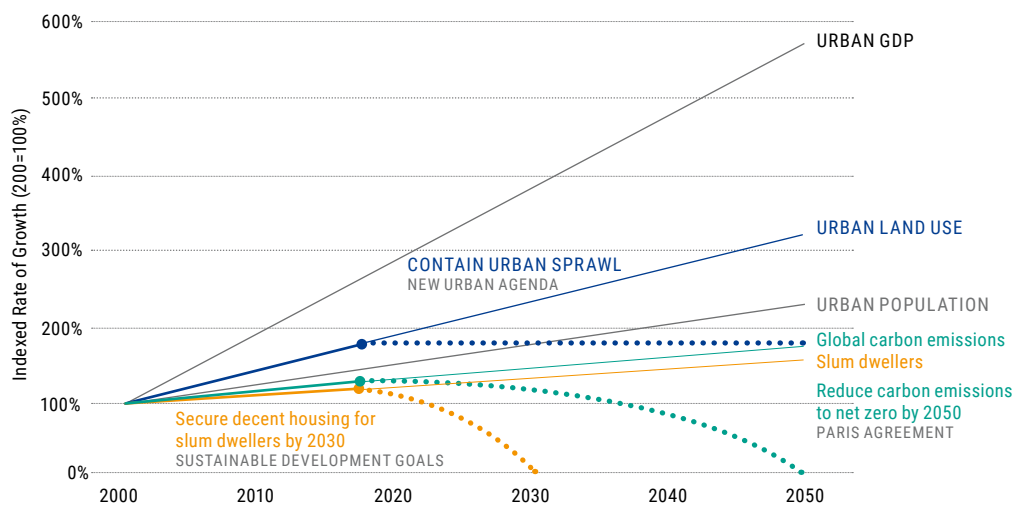
The conclusions of these studies, compiled in "Climate Emergency, Urban Opportunity" (Coalition for Urban Transitions, 2019), defend the idea that technological and organisational solutions already exist and could reduce GHG emissions by 90% while meeting populations' socio-economic needs (access to basic services, employment, etc.). While the report focuses more on convincing of the economic, social, and environmental policies of these solutions by 2050

(USD 34 billion), it points out that currently, only 2 countries out of 5 have a national strategy for cities, and only 7 countries have both National Urban Policies and NDCs that include mitigation actions in cities.

Rather than "bridging the gap", the ability of local governments to implement low-carbon and resilient development needs to be more deeply integrated into multi-level climate governance ([H. Fuhr, T. Hickmann, K. Kern](#), 2018). It means, concretely, integrating their climate planning process in higher level of government's ones, and for national and intermediary authorities to show concrete policy, technical and financial supports towards local and subnational governments.

However, cities' and regions' climate action can be hindered by inconsistent internal positions or by local actors.

NGOs remind us that "too often, we've seen cities declare an emergency and then back climate-wrecking policies like airport expansion" ([SmartCities World](#), 2019). City efforts can be opposed by actors such as the Canadian Plastic Bag Association that recently won a round in Victoria, B.C. after the provincial Court of Appeal ruled unanimously that a local bylaw was beyond municipal jurisdiction ([Energy Mix](#), 2019). These examples show the importance of further dialogue between local governments with private and civil society actors, but also shows the support required by federal or national policies to ease cities' and regions' actions. Partnerships may mean simple goal alignments, or may involve more proactive and complex collaborations such as the Business Council on Climate Change (BC3) in the San Francisco Bay Area, formed 10 years ago to bring business into conversation with the city ([Greenbiz](#), 2019).



Lastly, global figures of cities' and regions' achievements confirm the momentum around the world and beyond Western regions, but they do not sufficiently capture the diversity of climate actions undertaken in underrepresented regions, or where climate actions are not formally institutionalised.

The 2019 ["Global Climate Action from Cities, Regions and Businesses"](#) report found +6,000 cities and regions making quantifiable commitments to reduce GHG emissions in 9 high-emitting countries plus the EU, with an average emissions reduction target of 27%, "reflecting the short-term (-2020) nature of most of the targets". Beyond targets, tracking their overall achievements remains a challenge, and the report preferred assessing

international cooperative initiatives (ICIs) and their output performance: out of the 190 initiatives, 170 are considered "active" as of mid-2019, in which sub-national governments and businesses account for the lion's share of participants with almost 40% of ICIs' membership each. Very few ICIs are very large, and the median number of participants actors in an initiative is 39.

The Climate Chance Observatories through its 2019 "Local Action Book" brings complementary and qualitative analyses of cities and regions that aligned their public policies to achieve climate (mitigation or adaptation) and energy goals, stimulated local economies and tailored solutions for inhabitants.



“Local Action Book”

Key takeaways



1 Few new aggregated results in terms of reduction of emissions are available at the scale of initiatives and networks of communities.

As part of the Covenant of Mayors in Europe, 300 new monitoring plans were issued in 2019 by European cities, reaching a total of 2,850. These plans allow the monitoring of the implementation of climate plans submitted by the signatories of the Covenant; however, the aggregation of these new data is not available yet.

The 124 regions that reported their data to the CDP between 2015 and 2019 under the Under2 Coalition initiative show an average reduction of 14.2% of GHG emissions, +3,500 initiatives implemented and represent 670 million inhabitants. Several regions around the world are performing better: the State of Mexico -22%; South Australia -20%; or Attica -25%.

For cities, the CDP data make it possible to assess the evolution of their emissions on a case-by-case basis. We have identified 10 cities encouraging trajectories thanks to the last 4 years of city reporting: Stockholm -30%; London -23%; Madrid -10%; Cape Town -7% etc.

Finally, 4 new cities in the C40 network were able to show that they had reached their peak emissions by providing the data needed to establish a continuous decline over 10 years. At the same time, the C40 has calculated that consumption of 79 cities in its network amounted to 3.5 GtCO₂e, 60% more than city-wide emissions (2.2 GtCO₂e), meaning that two-thirds of their emissions are due to imports.

2 The pace of cities' adherence to global initiatives is slowing, but the commitment extends to all continents and through various tools and frameworks.

The launch of many Regional Covenants did not achieve a similar pace of accession as those observed at the launch of the European Covenant of Mayors. Nevertheless, the initiative is progressing on all continents, with 1,411 signatory cities (600 million inhabitants) outside the cities of the EU and Western Europe, including 172 cities in Sub-Saharan Africa (112 million inhabitants).

A similar finding on the part of the regions: the pace of new regions joining the Under2 Coalition and the RegionsAdapt initiative and reporting their emissions slowed down (+4 in 2019, against 10 in 2018 and nearly 50 in 2017) but are progressing in Latin America and Africa. As for RegionsAdapt, the initiative has acquired a new member in 2018.

The dynamism of cities and regions in Latin America is particularly notable. 343 cities (298 million inhabitants) committed themselves to the Global Covenant of Mayors and handed over 60 additional inventories in 2018. The Latin American regions published 12 new inventories in 2018, the largest increase between continents.

3 In some countries, the lack of contributions to these initiatives hides intense activity.

Adherence to international initiatives does not necessarily reflect the activity of cities and regions in countries, subject to national obligations, or benefiting from national tools and mechanisms. For example, of the 1,700 communities in the Philippines that are required by national legislation to formulate a local action plan, more than 1,000 have fulfilled their obligation now, but few of them report on international platforms. Similarly, in Korea, in 2015, 210 out of 240 cities had already submitted their Local Agenda 21 for Sustainable Development, which had been required by law since 2008. In many of these countries, international initiatives of cities come to support existing actors and their tools, through workshops or the dissemination of good practices.

4 A growing importance is given to adaptation in climate policies and the reporting process of local governments.

On the regions' side, the RegionsAdapt initiative now has 71 members. In 2018, 38 reported their data on risks and vulnerabilities to climate change, but also 165 adaptation actions, mostly on risk monitoring, awareness and planning. Half of them now have an adaptation plan.

On the city side, the signatories of the various Covenants of Mayors have reported a total of 238 adaptation plans since their launch, most of which come from North America (31). ICLEI's 2018 analysis of more than 1,000 cities on the carbonn Climate Registry provides insight into the state of play of cities in implementing adaptation strategies: only 21% of communities have started a process of strategy formulation, and 9% have reached the stage of implementation. 70% of the adaptation actions are financed by communities' own funds, illustrating the additional potential of action that could be implemented thanks to more external funds.

For an in-depth analysis of the adaptation actions implemented by the communities, go through the "Adaptation Book" which draws up a 2019 assessment of adaptation actions.

5 Many reports in 2019 seek to promote job creation and socio-economic impacts.

These studies stress the importance of socio-economic and health co-benefits, to show that these gains are well above the additional cost of low-carbon solutions. Some even try to quantify these gains: [Climate Opportunity: More Jobs; Better Health](#) estimates that building renovations, bus networks and district heating and cooling together can reduce carbon emissions significantly (1,242 MtCO₂), create 13.7 million jobs, and avoid 300,000 premature pollution-related deaths.

Other examples also show that climate and development are mutually supportive. "[Driving Climate Action: State Leadership in India](#)" concludes that the 10 best-performing Indian federal states in terms of climate action (emissions per person, renewable rate, forest cover) are also those with the best socio-economic indicators (revenues by residents, access to essential services).

6 13 new case studies of cities and regions (Section II) illustrate how the alignment of local public policies to implement adaptation and mitigation objectives

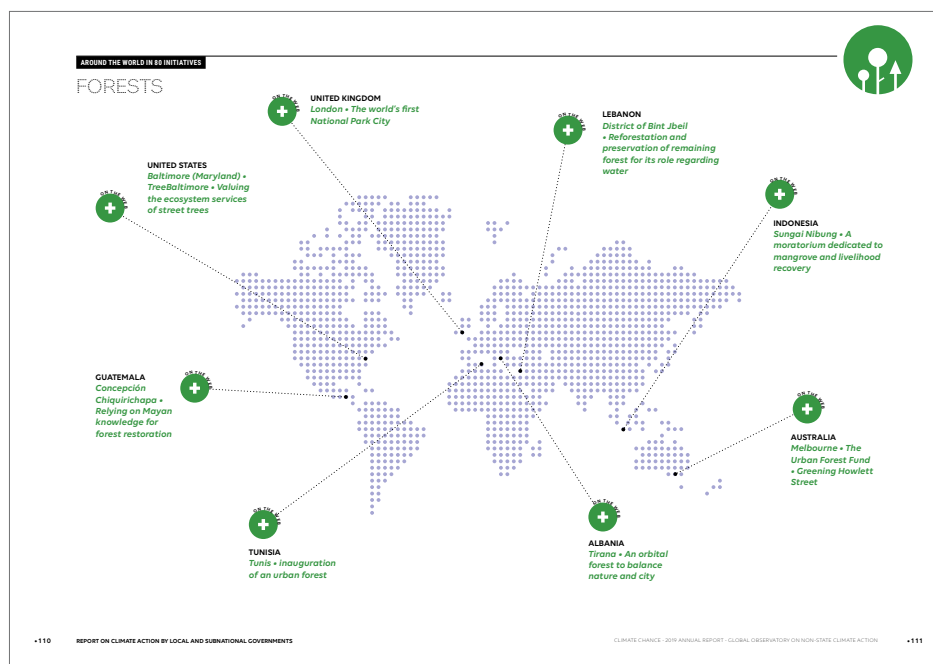
allows significant results in terms of GHG emissions, energy consumption but also forest cover, modal shifts, or the ability to collaborate with local stakeholders and citizens.



13 NEW CASE STUDIES OF CITIES AND REGIONS

7 Analyse climate actions in view of the Sustainable Development Goals (Section III)

The Report of the Secretary-General on SDG Progress 2019 already stated that “many local governments systematically took the initiative to implement SDGs, going further than national governments in some cases”. This is why the Observatory is now linking its selection of 80 remarkable climate initiatives, led by local public authorities, to the corresponding Sustainable Development Goals (SDGs) they address, in order to bridge the gap between climate action and socio-economic issues. The objective is to illustrate concrete action led by local authorities and to identify international trends within policy instruments and implemented policies.



ANALYSE CLIMATE ACTIONS IN VIEW OF THE SUSTAINABLE DEVELOPMENT GOALS



URBAN PLANNING



ENERGY



WASTE



BUILDING



FOREST



FOOD



TRANSPORT



ADAPTATION



AWARENESS



DECENTRALIZED COOPERATION

SECTION I



Local governments' progress in climate policy implementation



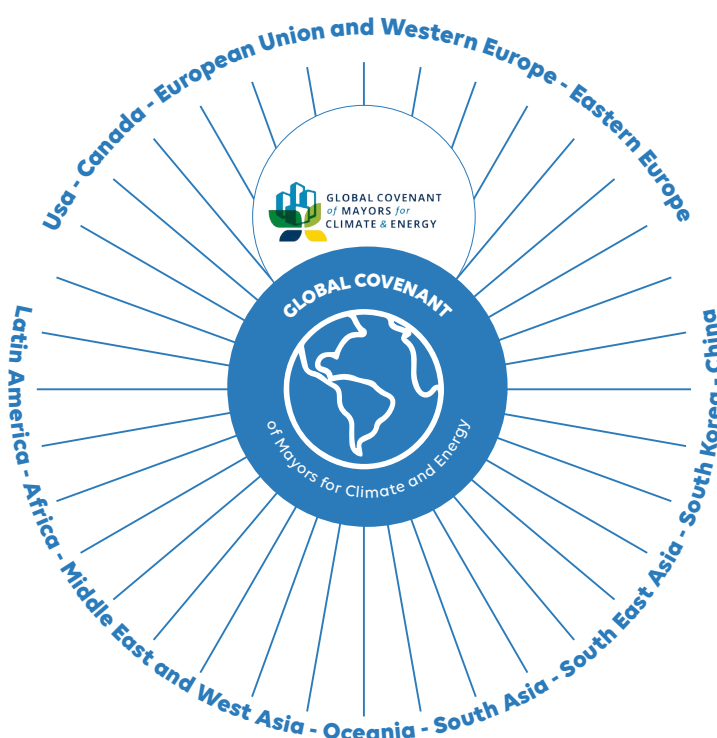
International Climate Initiatives for Cities & Regions

Global Covenant of Mayors (GCOM)

The Global Covenant of Mayors for Climate & Energy is an international alliance of cities and local governments arising from the merger in January 2017 between the “Covenant of Mayors for Climate & Energy” launched in 2008 by the European Commission, in cooperation with the main European local government networks (CMER, Energy Cities, FEDARENE, EUROCITIES, Climate Alliance, ICLEI Europe), and the “Compact of Mayors” launched worldwide in 2014 by ICLEI, CGLU and the C40. The aim of this merge was to increase the understanding and consistency of city and regional mobilisation and to facilitate the aggregation and monitoring of local climate data. The GCOM platform is now fed by two platforms: MyCovenant (dedicated to the Covenant of Mayors in Europe and some other regions) and the merged platform of cCR and CDP-Cities.

FIGURE 1

NATIONAL AND REGIONAL COVENANTS OF MAYORS IN 2019



2019 Evolution, deliverables, and governance

As of August 2019, the Global Covenant of Mayors (GCOM) gathered 10,263 signatory cities from 139 different countries and split 12 regional or national covenants that the Secretariat breaks down into 10 regions as (see [city profiles database](#)). The launch of new a regional and national covenant since 2015 did not have the same impact as the launch of the Covenant of Mayors in Europe in 2008 in terms of cities joining the initiative (fig. 2), but new commitments are geographically more diverse than before with a majority of cities joining in 2018 coming from Sub-Saharan Africa (SSA), North America, or Latin America and the Caribbean (LAC) (fig. 3).

FIGURE 2

NUMBER OF CITIES COMMITTING TO THE COVENANT OF MAYORS THEN TO THE GCOM EVERY YEAR FROM 2008 TO 2019 - (AS OF JUNE 2019)

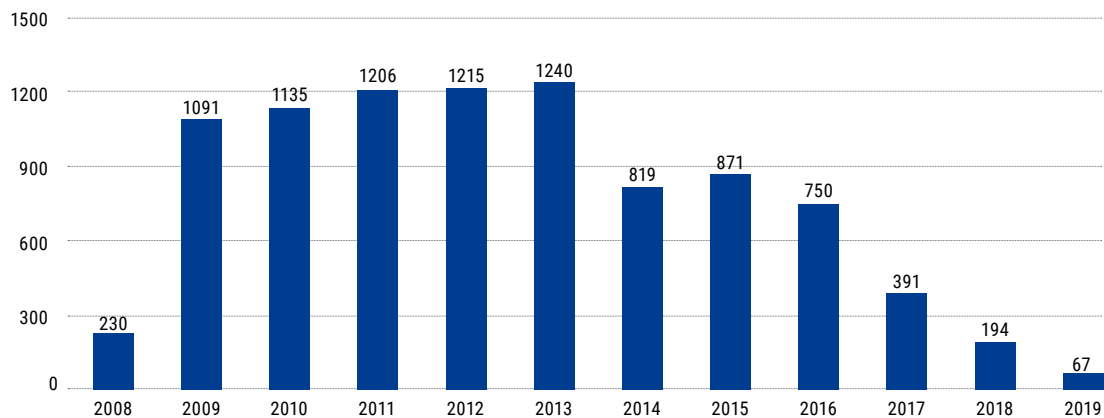
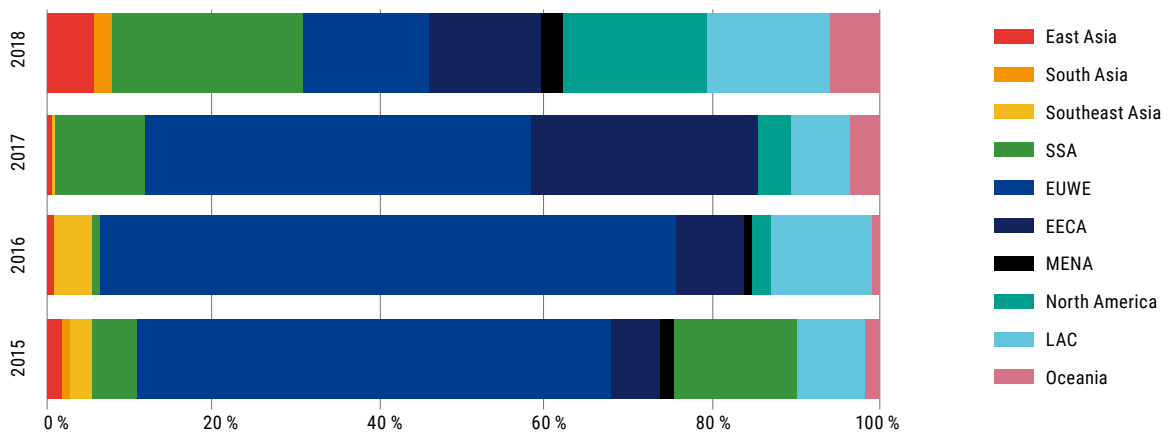


FIGURE 3

GCOM COMMITMENT GROWTH BY REGION, 2015-2018



Out of the European Union and Western European cities, the total number of signatories reached 1,411, representing around 600 million of inhabitants and have reported cumulatively 315 GHG inventories, 238 mitigation plans and 87 adaptation plans in 2019 (fig. 4).

- Regional covenants seem to incentivize local governments to voluntarily initiate a climate planning process or simply report it on public platform: cities in Asia, Africa, the Middle East, America (North and South) and Oceania have reported in 2019 twice more inventories (201), and almost thrice more action plans (97 mitigation plans and 69 adaptation plans).
- Latin America and the Caribbean observed the greatest increase in signatories with almost 150 additional cities joining the regional covenant. The 363 cities represent now 158 million people and 25% of Latin America's population.
- Latin American cities have also delivered consistently, with 60 additional reported inventories compared to 2018.
- Action plans increased the most in the Middle East and in North Africa with 30 new plans submitted to the regional covenant in 2019.
- In Asia, the existing initiatives mentioned below (box1) and supported by States and widely used by cities, seems to hinder the number of cities committing to Asian regional covenants. The 3 regions (East, South-East and South Asia) stand for around 140 million people and around 5% of Asia's total population.

BOX 1

NATIONAL INITIATIVES CAN LIMIT THE ADDED-VALUE OF INTERNATIONAL REPORTING: THE EXAMPLE OF ASIA

Since the 2009 Climate Change Act, the Philippines's 1,700 Local Government Units (LGUs) must formulate and implement Local Climate Change Action Plans (LCCAP) to mitigate and adapt to the effects of climate change. While only 137 LGUs had fulfilled this obligation in 2015, they are 1,073 to have done so in 2019 – although only 29 Filipino LGUs are listed on the GCoM website.

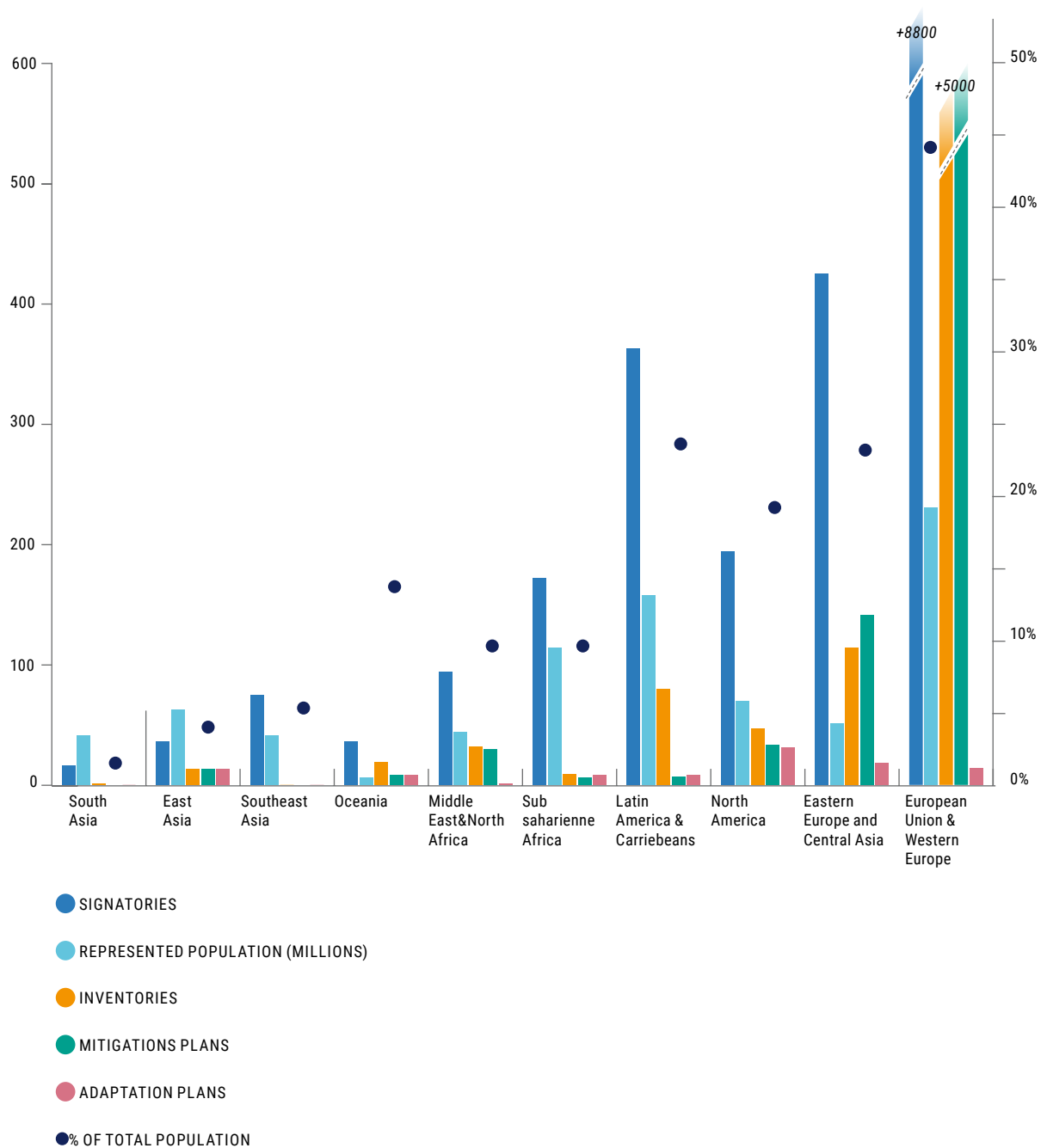
18 Indonesian cities are recorded on GCoM platform, but the national government has long had the practice of integrating mitigation and adaptation actions of subnational and local actors in its national strategies and monitoring processes. Indonesia set up 3 tools and platforms: SIGN supports national and subnational governments in calculating their greenhouse gas (GHG) emissions; PEP PPRK provides data and monitoring and evaluation processes for strategies aimed at climate change mitigation and records 12,500 mitigation actions in the 34 provinces and 355 MtCO₂e of GHG emissions reduction since 2010; SIDIK provides data on vulnerability assessment based on exposure to climate-related risks.

In South Korea, the Framework Act on Low Carbon Green Growth (2009) mandates that every five years the national government must formulate an adaptation strategy and local governments must establish implementation plans for the adaptation strategy. The Framework Act on Sustainable Development (2008) also stipulates that national and local governments establish an implementation plan for sustainable development every five years for the implementation of the Sustainable Development Goals as well as mitigation actions. By 2015, 210 out of 240 local governments in the Republic of Korea had established a Local Agenda 21 for Sustainable Development. Around 100 local governments created local councils for sustainable development to implement their decisions.

Source: [Climate Change Commission](#), 2019; [Urban LEAD](#), 2018; [PEP PPRK](#), 2019; [Lee, J.-S., & Kim, J.](#) (2018); UNRIS, 2016

FIGURE 4

GEOGRAPHICAL DISTRIBUTION OF SIGNATORIES, THEIR DELIVERABLES AND THE REPRESENTED POPULATION AS OF AUGUST 2019 - Source: GCOM online database for action plans and represented population - Number of signatories provided by GCOM Secretariat - % of population with population data from INED, France -



• **THE COMMON REPORTING FRAMEWORK LAUNCHED IN 2019** • Cities commit to delivering a *Sustainable Energy and Climate Action Plan* (SEACAP) within 3 years, covering three pillars: mitigation, adaptation, and access to energy. To ease the planning and reporting among regional covenants, a *Common Reporting Framework* (CRF) was adopted in September 2018 (fig. 3).

This framework notably takes up guidance's followed so far by European Cities and elaborated by the European Joint Research Centre (JRC), and aim to be flexible enough to adapt to each regional covenant's context:

- 3 levels of reporting: mandatory, recommended and additional;
- Arrangements depend on cities' regional constraints (example: reduced number of emission sectors required);
- The CRF is adapted to the existing national reporting frameworks (ex: Canada, Japan, France etc);
- A single compliance review of climate plans is sufficient (example: a European city SEACAP considered as compliant by the JRC with the guideline of the Covenant of Mayors in Europe, is considered compliant with the Common Reporting Framework adopted by the GCOM).

FIGURE 5

TIMEFRAME OF THE REPORTING ELEMENTS REQUIRED WITHIN THE GCOM

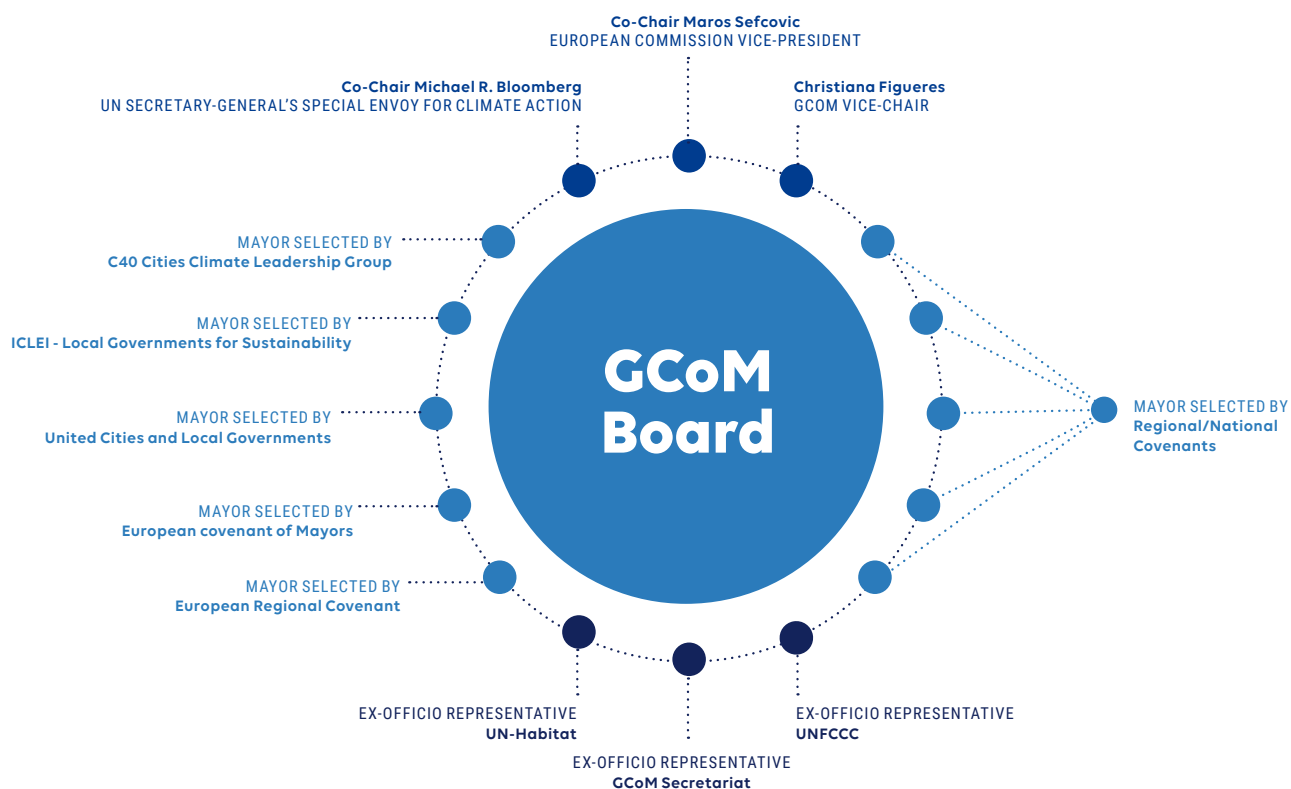
Source: Presentation of the GCOM Secretariat March 2019

REPORTING ELEMENTS	Year 1	Year 2	Year 3	Year 4	Year 5
1. Measuring GHG emissions - GHG emissions inventory	WITHIN 2 YEARS				
2. Assessing risks and vulnerability	WITHIN 2 YEARS				
3. Setting targets for reducing emissions and goals for increased resilience	WITHIN 2 YEARS				
4. Climate action planning, including mitigation and adaptation	WITHIN 3 YEARS				
5. Energy access planning	TO BE DEFINED				
6. Reporting progress (incl. GHG emissions inventory)				EVERY 2 YEARS AFTER SUBMITTING THE CLIMATE ACTION PLAN	

GOVERNANCE OF THE GCOM IN 2019 The Global Covenant strategy is managed by the Board and the Steering Advisory Committee (SAC):

FIGURE 6

GCOM BOARD COMPOSITION - Source: GCOM Monthly Brief



- The Board
- The Strategic Advisory Committee (replaces the Council of founders at the end 2019) includes the Board members plus representatives of the UNFCCC, GCOM, UN-Habitat, Committee of Regions UE, European Joint Research Centre (JRC) and 7 other representatives of regional/national covenants.
- The Board recently approved the 2019-2020 Strategic Plan which includes the continued focus on the three core initiatives: Innovate4Cities, Data4Cities, and Invest4Cities.

• GCOM'S ACHIEVEMENTS IN ITS 3 PRIORITIES • Invest4cities: [Global Climate City Challenge](#) launched in September 2018 during the Global Climate Action Summit: with the European Bank of Investment, have pre-selected 20 projects out of 145 proposals and allocated 5 billion euros. 6 finalists will be announced by the end of 2019. [Cities Resilience Programme](#), led by the World Bank and the GCoM, assists cities as they formulate urban infrastructure projects capable of attracting private investments. 57 cities were involved as of early 2019: 52 cities have already carried out an assessment of their capacity to raise private capital, 5 cities are currently raising these funds, and 20 projects to which the CRP has contributed are under way or planned, which represents total investment of 2.2 billion dollars.

In September 2019, the GCoM, with the Governments of Germany and Luxembourg, launched the [City Climate Finance Gap Fund](#) – where both Governments have committed to invest together 100 million euros. The Gap Fund will address the critical lack of funding necessary to mature projects from concept to a stage where they can be advanced towards full feasibility analysis and being funded by investment banks. These 100 million in grants aim to unlock at least investments worth of 4 billion euros in low-carbon and climate-resilient infrastructure projects in cities.

FIGURE 7

TYPE OF DATA OFFERED BY THE ENVIRONMENTAL INSIGHTS EXPLORER

Source: Google Environmental Insights Explorer, 2019



[Data4cities](#): All of the GCoM signatories' profiles were updated in 2019 now offering the possibility of downloading data on GHG emissions and on the level of risk and vulnerability. In parallel, the GCoM partners on two other data portals project:

- The [Environmental Insights Explorer](#) (EIE), co-created in 2018 with Google, provides detailed data per emissions sector as well as potential renewable energy data. EIE is currently tested in 42 cities within 10 countries (fig.7);
- The WRI's [City Data Portal](#) that aims to help cities access activity data and emission factors, will make the data of 15 countries available by the end of 2019.

Finally, the GCoM explores a partnership with the European Space Agency's Copernicus programme to make satellite data available in a usable format for GCoM cities, with a focus on data-poor regions.

[Innovate4cities](#): The GCoM continues to advocate for national States to dedicate 1/3 of their investments to R&D in urban issues linked to climate change within 10 years; to 10 million additional students in climate change prior to 2025; and to collaborations between cities and businesses on data sharing. In May 2019, [Mission Innovation](#), a global initiative of 25 governments and the private sector dedicated to innovation and clean energy, partnered with the GCoM to establish an 18-month working group with 6-8 national governments members to support the delivery of this partnership consisting in sharing best practices to implement.

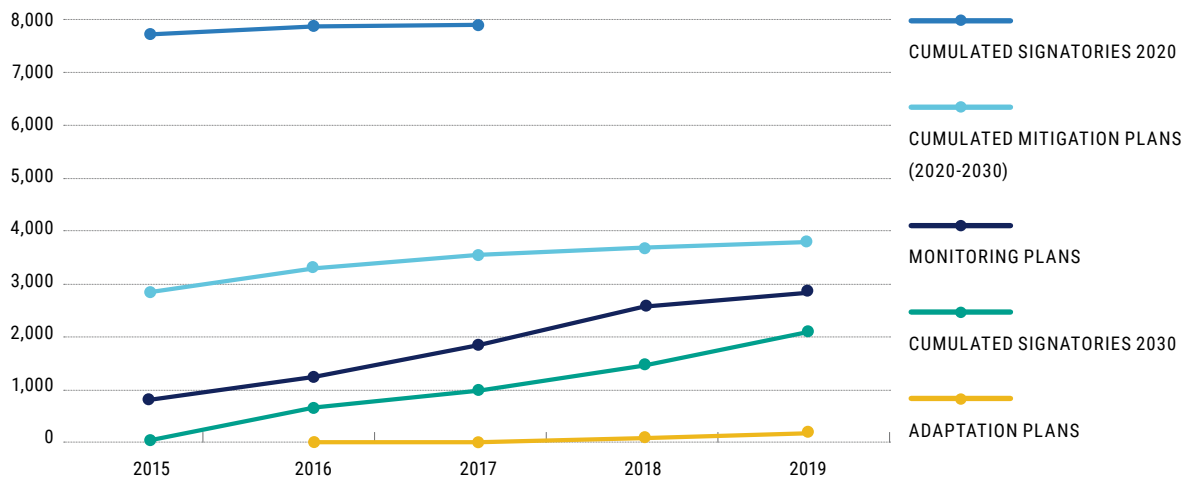
Regional covenants: focus on Europe, East Asia, Sub-Saharan Africa and Mediterranean

EUROPE

After more than 10 years, signatories of the Covenant of Mayors in the European Union, Norway, Iceland, Switzerland, are the most numerous with over 8,000 signatories and several progress as shown by their reporting platform MyCovenant:

FIGURE 8

SIGNATORIES AND THEIR DELIVERABLES OF THE COVENANT OF MAYORS IN THE EUROPEAN UNION AND THE EUROPEAN FREE TRADE ASSOCIATION FROM 2015 TO 2019 - Source: CoM Secretariat data



More than 600 additional cities have signed the 2030 objectives in 2019 aiming to overcome the EU's 40% GHG reduction target by 2030 and to adopt a *Sustainable Energy and Climate Action Plan* (SECAP) tackling mitigation, adaptation, and energy poverty until 2030. Most of 2030 signatories were also 2020 signatories, and new signatories can only pledge to 2030 since 2017.

- Adaptation plans are still largely missing with only 200 plans as of October 2019.
- 300 monitoring plans have been published in 2019, compared to the 700 published in 2018, reaching 2,850 as of October 2019. Monitoring inventories and plans should be submitted every four years after the initial inventory and climate plan to analyse cities' progress. Therefore, this number seems quite consistent since around 2,800 mitigation plans were submitted in 2015.
- As for cities' progress, unfortunately the Joint Research Centre (JRC) has not published yet a new analysis of recent achievements made by the European Union's signatories in terms of GHG emissions, energy demand reduction, or local renewable energy production. 2017 and 2018 studies are summarized in the [Book on local and subnational governments 2018 Edition](#)¹. JRC showed in 2019 that based on the reduction of GHG emissions observed through monitoring plans submitted by cities so far in 2017, they could achieve an emission rate of 0,15 tCO₂eq/capita by 2050, consistent with carbon neutral goals and the 1,5 °C trajectory.

¹ Kona, A. Bertoldi, A. and al. (2018). [Covenant of mayors signatories leading the way towards 1.5 degree global warming pathway](#). European Commission, Joint Research Centre, Directorate for Energy, Transport and Climate. Sustainable Cities and Society, Volume 41, Pages 568-575.
G. Melica; B. Koffi. (2017). [Covenant of mayors in figures - 8-years assessment](#). European Commission. Joint Research Centre, Directorate for Energy, Transport and Climate.

NEW EU LEGISLATION SHOULD FACILITATE MULTILEVEL DIALOGUE TO RAISE EU COUNTRIES' CLIMATE AMBITION

In the new legislative framework adopted in March 2019 “Clean Energy for all Europeans Package”, the Parliament has required from the Member States to set a multilevel dialogue at national level and to be able to integrate potential mitigation and adaptation actions from local actors (i.e. [Article 11 of the Energy Union and Climate Action Governance Regulation](#)). This process should help them to formulate their National Energy and Climate Plans (NECPs), and to evaluate the extent to which the action of local actors can raise Member States' climate ambition.

Energy Cities has gauged the extent to which cities were involved in the National Energy and Climate Plans (NECPs) whose drafting process officially ended in December 2018, before the final plans are submitted by December 2019. It also looks at whether local energy and climate actions are taken into consideration by Member States.

Results show a lack of recognition from States since only 5 NECPs (Belgium, Greece, Latvia, Romania and the United Kingdom) explicitly highlight at least one city's action, while 7 of them recognize local actions without highlighting specific actions. This is also the case for cities networks and initiatives since only the Covenant of Mayors is mentioned in 4 plans. As for their practical integration in the drafting process, only 5 States set specific consultation processes for local authorities (Estonia, Hungary, Greece, Latvia, Portugal), while 7 others indirectly consulted them through city associations.

Source: [Energy Cities](#), 2019

Several programmes have been launched in Europe in 2018 and 2019 to go beyond climate and energy planning and supporting implementation:

- [European City Facility](#) officially started in 2019 with the closure of the call for proposals in February 2019. It is a 16 million euros facility funded by Executive Agency for Small and Medium-sized enterprise (EASME), that supports 300 cities to formulate and present renewable energy and energy efficiency projects to investment banks. The facility is tailored for small grants and should specifically target technical assistance to small or medium cities.
- The European City Facility comes as a complement to other facilities targeting larger investments programmes such as ELENA a joint initiative by the EIB and the European Commission through the Horizon 2020 programme used to finance costs related to feasibility and market studies, programme structuring, business plans, energy audits, financial structuring, etc.
- [Build Upon²](#) is a European Union-funded project in partnership with the World Green Building Council (WGBC) to accelerate the renovation of buildings in European cities by strengthening the effectiveness of national building renovation strategies required by the EU Energy Performance of Buildings Directive (EPBD). 8 pilot cities – all covenant signatories – have pledged to completely decarbonise their existing building stocks by 2050. They will develop and test a multi-level renovation impact framework detailing a series of milestones and measurable progress indicators including emissions reductions, increased employment and improved health.

Other tools are developed to provide information and support the decision-making process:

- “[Hotmaps](#)”, an EU H2020 programme, is an open source software to support planning processes of the energy sector on the local level and reduce emissions and consumption from heating and cooling (H&C). It quickly provides a first estimation of the H&C demand in an area and analyses the potential of local renewable energy to cover it.
- “[Interregeurope](#)” is a space for continuous learning where you can tap into the know-how of experts and feedbacks from peers on the four programme topics: research and innovation,

SME competitiveness, low-carbon economy, and environment and resource efficiency. The first peer reviews were carried out on the 'Absorption of structural funds for energy efficiency in social housing and public buildings' and on the 'Coordination and implementation of a joint multi-municipality Sustainable Energy and Climate Action Plan - SECAP'.

- "[Urban Adaptation Map Viewer](#)" provides an overview of the current and future climate hazards faced by European cities and to gain understanding of the current and projected climate impacts in Europe. It has been developed by Climate-ADAPT, in partnership between the European Commission and the European Environment Agency (EEA).

BOX 3

26 EU CITIES WORK TO REDUCE TOURISM'S ENVIRONMENTAL FOOTPRINT

Up to 26 cities, including Copenhagen (Denmark), Lanzarote (Spain) and Krakow (Poland), have signed a Charter of commitments that reflects the intention of local and regional authorities to reduce waste generation and to transition the tourism industry towards a circular economy. Tourism is the third largest economic sector in the EU, but has also a significant impact resulting from infrastructure, transport and waste generation. The Charter also aims at reinforcing "the attractiveness of the territories" and boosting local development "by creating new green jobs and services locally," in light of a UN call for a more economic, social, and environmentally sustainable form of tourism.

Source: [Euractiv](#), 2019

ASIA

The regional covenant of East Asia relies on the European Programme "International Urban Cooperation" (IUC) office and its collaboration with China, Korea, Singapore, Hong Kong, Malaysia, Indonesia, and Vietnam. In several countries (particularly China, Korea, and Japan), the covenant needs to adapt its collaboration to various national initiatives already in place, and mostly comes as an external support through training and best practices sharing.

In China, the National Development and Reform Commission (NDRC) established the Low Carbon Cities Provinces (LCCP) program in 2010, prioritized by the government over international initiatives. The demonstration phase of 5 low-carbon pilot provinces and 8 pilot cities has now been extended to 87 pilots through three batches, including 6 provinces, 79 cities and 2 counties ([ESCAP-ENEA](#), 2019). Most of the pilot cities have stricter reduction ratios of carbon emission intensity than the national upper range value of 45%. An assessment of the first 2 LCCP batches shows that the decrease of carbon intensity in the pilot provinces and cities was higher than the national average. A number of good practices also emerged: Nanchang set local legislation on climate change whilst Guangyuan set specialized agencies for LCC ([Institute for Urban & Environmental Studies](#), 2017).

In Korea, national legislation since 2010 makes local climate plans mandatory for most Korean cities. With the assistance of the Ministry of Environment, the Korean Environmental Institute supports local governments' low carbon plans, and most cities have already met their obligations. IUC-Asia organises general training for local Korean governments ([IUC-Asia](#), 2018). Lastly, in Japan, the [Japan Climate Initiative](#) gathers 30 cities committed to the initiative.

In Indonesia, Malaysia and Vietnam, IUC works with UCLG-ASPAC to form the GCoM secretariat of the regions. 5 cities in each of these countries are pilot cities supported in their development of

Climate Action Plans (CAPs) within the GCoM - CRF reporting platform, through dedicated training sessions and direct coaching by national and international experts. These 15 cities will launch their respective CAPs in 2020. Indonesia takes part to the GCOM process but preserve its own national platform to support adaptation and mitigation planning and assessment, the Vulnerability Index Data Information Online System ([SIDIK](#)) or the PEP-PPRK (Information system for Monitoring, Reporting and Evaluating Low Carbon Development Planning). The technical assistance to selected pilot cities is further granted through a more extensive capacity building process on CAPs' development, involving 25 cities per country.

Finally, to foster regional cooperation, the [Platform Exchange on Climate and Sustainable Energy](#) (PEX), intends to facilitate in-depth cities' peer-based learning and forge greater co-operations among cities in South East Asia. The Platform is compiling a catalogue of actions with a call for contributions and will connect cities in need with "mentor" cities.

SUB-SAHARIAN AFRICA

The Covenant of Mayors in Sub-Saharan Africa is achieving in 2019 the second phase of its implementation. Since 2018, the secretariat has conducted 8 workshops for the 13 pilot cities to strengthen the capacity of their administrations at various stages of the realisation of a Sustainable Energy Access and Climate Action Plan (SEACAP).

The initiative already allowed some tangible projects to be implemented. In Togo, 8,200 fuel efficient stoves are currently being distributed to communities in the city of Tsévié as part of the European Union (EU) funded "Promoting Energy for Development programme". In Bouaké in Côte d'Ivoire, the EU funded project "Bouaké, Green City – Decentralized Cooperation" and technically supported by the CoM SSA.

The initiative aims to go beyond the mere support of climate planning by helping projects of 15 cities through a financing pipeline to be able to get funds from private sector, banks and financial institutions, and mobilising 160 million euros for climate and energy projects.

BOX 4

SPECIFIC GUIDEBOOKS IN DEVELOPING A SEACAP IN SUB-SAHARAN CITIES

Specific guidebooks have been offered by the European Joint Research Centre (JRC) for regions or countries (Sub-Saharan Africa, India etc.) to complement and support GCoM methodologies in developing a SEACAP. The first one for Sub-Saharan cities has been released in December 2018. This document has been prepared to assist local authorities in Sub-Saharan Africa formulate a Climate Action Plan and implement the 3 pillars. It provides step-by-step guidance and examples of measures relevant for local authorities in the Sub-Saharan context.

Source: [EU Science Hub](#) – Short Starting Guide, 2019

MEDITERRANEAN

The Ces-Med project, completed in April 2018, was extended through a new project, "Clima-Med", financed by the European Union in June 2018, as a way of supporting southern neighbouring partner countries in their low-carbon, climate-resilient sustainable development. More specifically, Clima-Med contributes to the implementation and strengthening of the Regional Covenant of Mayors of the Mediterranean (CoM-Med), and promotes the elaboration and implementation of a Plan for Access to Sustainable Energy and for Climate (PAADC). The programme involves cities in these countries: Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, and Tunisia. The programme has an on-site presence in both Beirut and Rabat.

The 48-month-long "Clima-Med, Acting for Climate in South Mediterranean" project provides support to sustainable energy policies and strategies on both local and national levels as well as technical assistance on the elaboration of PAADCs in line with the principles of the Global Covenant of Mayors. Accessing Climate Finance will be the project's third essential component as it will facilitate investments and allow beneficiaries better access to funding mechanisms.

For instance, several activities have enabled 11 Moroccan communities as well as 22 Jordanian and 10 Palestinian municipalities to participate in a workshop on the formulation of the PAADCs.

Data evolutions of cities' reporting platforms

Three platforms feed the Global Covenant of Mayors database in line with the reporting criteria outlined in the Common Reporting Framework. MyCovenant gathers data from cities of the Covenant of Mayors in the European Union, the Mediterranean, Eastern Europe, Central Asia, and sub-Saharan Africa. The two other platforms, CDP-Cities and carbonn® Climate Registry, merged in 2019 their reporting processes, and cities now fill a single reporting form on the CDP platform where the data and actions are automatically transferred to the cCR.

• 2019 REPORTING CITIES USING CDP'S FORM •

In 2018, 641 cities filled the CDP reporting form - 489 among them reported publicly. Out of the publicly available sample, 284 of them assert having conducted an inventory of territorial GHG emissions, but only 228 communicated this data of combined direct and/or indirect GHG emissions. **These 284 cities account for 315 million inhabitants and 1.91 GtCO₂eq, or an additional 0.5GtCO₂eq and 45 million inhabitants compared to 2017 – a significant increase most likely due to the launch of Regional Covenants of Mayors.**

In 2019 among the 765 cities that filled the form, far more made their data public (719) compared to 2018 (+47%), and so were those that declared a city-wide inventory (468), +64% compared to 2018. Lastly, in 2019, cities can also report their consumption-based inventory, taking into account emissions due to the consumption of products and services.

TABLE 1

CDP'S REPORTING ELEMENTS - Source: CDP online Database

Year	Number of cities having reported their territorial emissions to the CDP	Total of reported GtCO ₂ eq	Consumption-Based inventory made (or in progress)	Population represented (in millions)
2015	119	1,25		
	46			
2016	187	1,29		
	84			
2017	229	1,41		
	101		45	
2018	284	1,91		
	115		45	
2019	719		47 (26)	
	115			

● NUMBER OF CITIES ATTESTING OF A REDUCTION IN THEIR EMISSIONS COMPARED TO THE PREVIOUS INVENTORY.

● NUMBER OF CITIES ATTESTING OF AN INCREASE IN THEIR EMISSIONS COMPARED TO THE PREVIOUS INVENTORY.

Other cities are conducting their first GHG inventory, have not noticed any evolution or changed methodology

An increasing number of cities (115, as opposed to 101 in 2017) declared reduced emissions compared with their previous inventories, and some of them with several previous inventories (Table 2).

TABLE 2

EXAMPLES OF CITIES REPORTING A DECREASE OF GHG CITY-WIDE EMISSIONS - Data Source: CDP Database

Cities (Country)	Covered Scope*	City-wide emissions reported between 2016 and 2019 in MtCO ₂ e (accounting year)				Evolution between first and last inventory
		2016	2017	2018	2019	
Stockholm (Sweden)	Basic +	2.52 (2012)	1.79 (2015)	1.82 (2016)	1.75 (2017)	- 30%
Porto (Portugal)	Scope 1, 2	1.02 (2009)	0.961 (2015)		0.962 (2016)	- 6%
London (UK)	Scope 1, 2	40.19 (2013)	40.09 (2014)	33.68 (2015)	31.07 (2016)	- 23%
Kadivacik (Turkey)	Scope 1, 2	444 tCO ₂ (2015)	413 tCO ₂ (2016)			- 7%
Hoeje-Taastrup (Denmark)	Scope 1, 2 + land use	0.297 (2014)	0.275 (2016)	0.252 (2017)	0.259 (2018)	- 13%
Madrid (Spain)	Basic	10.26 (2013)		9.24 (2014)		- 10%
Espoo (Finland)	Basic +		1.23 (2015)	1.14 (2017)	1.10 (2018)	- 11%
Cape Town (South Africa)	Basic	22.64 (2012)	21.23 (2015)		21.15 (2017) (Basic + = 22.38)	- 7%
Bologna (Italy)	Scope 1, 2	2.27 (2009)		2.00 (2013)	1.86 (2015)	- 18%
Austin (USA)	Basic +	13.70 (2013)		13.49 (2016)	12.49 (2017)	- 9%

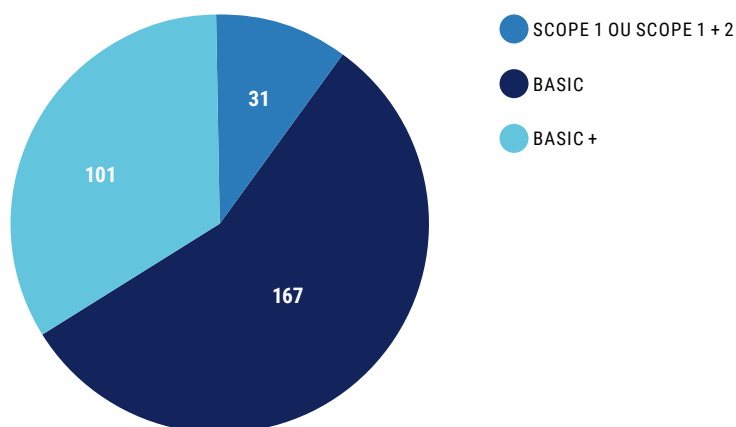
BASIC: DIRECT EMISSIONS (SCOPE 1), EMISSIONS FROM ELECTRICITY GRID (SCOPE 2), INDIRECT EMISSIONS FROM WASTE (SCOPE 3).

BASIC +: BASIC, EMISSIONS FROM LAND USE AND INDUSTRIAL PROCESS.

This data must be cautiously analysed. Indeed, from one year to the next, the methodologies used by the cities can change or be refined with better and more available activity data, for instance. Thus, the magnitude of the scopes considered as well as the types of GHG considered may vary from one city to the next and from one year to another for the same city. In short, this data provides a much better representation of climate action trends, but can hardly be compared among cities (see Annex II page 59 on the different methodologies to calculate GHG emissions).

FIGURE 9

NUMBER OF CITIES REPORTING TO THE CDP IN TERMS OF CONSIDERED EMISSIONS SECTOR - Data Source: CDP Database



In 2018, simply looking at the cities using the reporting categories of the Global Protocol for Cities methodology, 167 cities publish BASIC emissions – those include scopes 1 and 2 as well as waste-related indirect emissions – while 101 cities public “BASIC +” emissions – those include the emissions due to land use change and industrial processes in addition to all of the BASIC sectors (fig. 9). A BASIC + inventory requires robust data collection system: unsurprisingly, 67 of these cities are in Europe, North America, Australia and New Zealand. Most of Asian cities are in Taiwan, Japan and China, while in Africa, in addition to Cape Town, Johannesburg, and Durban in South Africa, Accra (Ghana), Lagos (Nigeria) and Moroni (Comoros) have covered such scopes.

BOX 5

CDP COMPILED ITS FIRST-EVER A-LIST OF TOP PERFORMING CITIES

The CDP has previously used data to release a Corporate Climate A List since 2011 and a Water and Forests A Lists since 2015 and 2016, respectively. It released its first-ever A-List of climate cities, with some 596 cities each being given a score between A and D- based on their environmental performance. Cities scoring an A are considered by the CDP as taking ambitious action to reduce their emissions and tackle climate-related risks

Of those cities to receive the highest score, 24 are in North America, 9 in Europe, and 8 in Asia and Oceania, respectively. Cape Town was the only African city to make it onto the A-List, while Buenos Aires was similarly Latin America’s sole representative. 14 of these cities are said to be working towards climate neutral or carbon neutral targets by 2050. Canberra, Paris, Minneapolis, and San Francisco have also set their sights on a city-wide 100 percent renewable energy goal. Only Reykjavík has achieved this, using hydro and geothermal energy.

Source: [Cities Today](#) 2019

• THE CARBONN® CLIMATE REGISTRY (CCR) ANALYSIS OF ADAPTATION PLANNING •

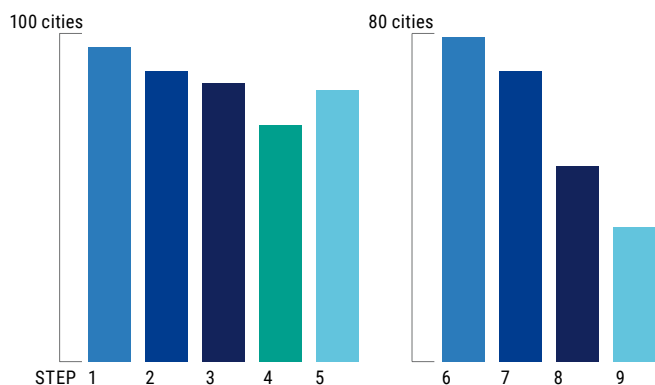
The 2018 cCR digest “[Multilevel climate action: The path to 1.5 degrees](#)” published for the COP24 in December 2018 focused on cities in line with the Paris Agreement and giving greater importance to the adaptation planning process. The report estimates the per capita emission allowance for the 1.5-degree target is 2.2 metric tons per person per year by 2030. Therefore, based on the cCR batch of data, they analyse that:

- Out of 392 reported community-scale mitigation targets: **22 reporting entities with an established trend (a trend based on at least three reported community inventories over time) are on track to align with the 1.5-degree target.**
- As for the emissions reduction rates targeted, 184 cities are more ambitious than the National Determined Contribution of their respective country.
- Most of the cities aligned with the 1.5-degree target or with more ambitious targets are in Nordic countries and India, countries aligned with a 1.5 to 3 degrees pathway. Other cities aligned with the 1.5-degree target can also be found in countries with > 3°C compatible NDCs (i.e. Japan, USA), valuing even more their efforts.

Since 2016, the cCR incorporates in its reporting process an adaptation section called “CRAFT” also used in CDP and GCoM reporting analysed by ICLEI in “[Data speak louder than words](#)” in 2018 and incorporated in more detail in our 2019 Book on Adaptation Non-State Climate Action. It maps climate hazards and gives an outlook of the progress made by 295 local and subnational governments in adaptation planning and strategies.

FIGURE 10

STAGES OF URBAN ADAPTATION PLANNING FROM POLITICAL COMMITMENT PROCESS (STEPS 1-5) TO PLANNING AND MEASURING (STEP 6-9) - Source: ICLEI, [Data speaks louder than words](#)



More than half of them (58%) have completed or are developing a climate risk or vulnerability assessment, while 19% do not have or are not making provisions for such a step in the reporting period. As shown in Figure 8, cumulatively, only 21% of the reporting governments is taking or is in the process of starting the political commitment process to planning for climate adaptation (STEP 1 to 5). Less than 30 of them are cumulatively recorded for “advanced step” of planning and measuring (STEP 6-9), meaning they have completed or in the process of completing the measured progress of adaptation actions (STEP 8) and the update of the adaptation plan accordingly (STEP 9).

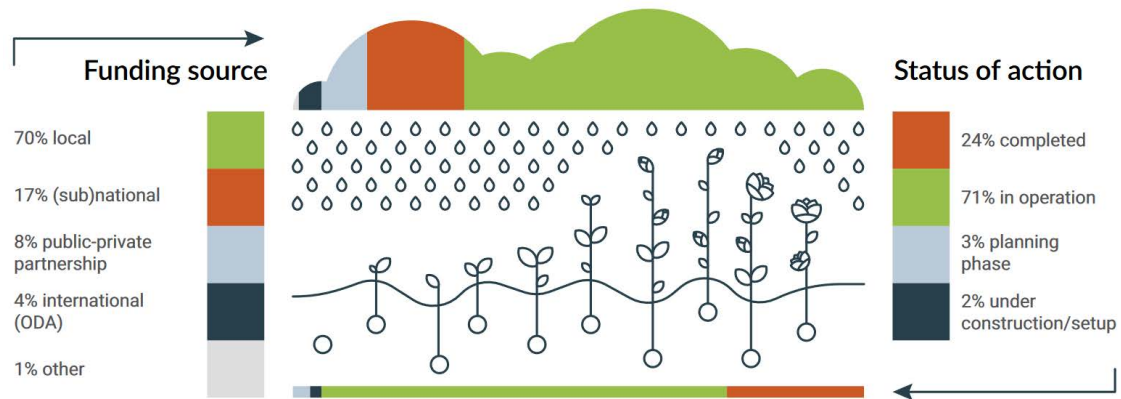
Thus, most of cities are currently initiating their adaptation planning, pointing a need for support in conducting climate risk and vulnerability assessments.

A total of 2,046 “adaptation-relevant actions” (adaptation actions only or with secondary focus on mitigation) were reported. **The large majority (70%) are financed by local finance and 71% are currently being implemented (fig. 9).** It shows the great potential of additional climate action that could be undertake with external fundings (national or international), and the fact that beyond planning, capacities for implementation are progressing, and financing remains a structural barrier for implementation.

FIGURE 11

STATUS OF ACTIONS (ON THE RIGHT) AND THE SOURCE OF ADAPTATION FUNDING (ON THE LEFT)

Source: Retrieved from ICLEI, [Data speaks louder than words](#)



Finally, 160 reporting cities and regions identified major factors enhancing their adaptive capacity and elements that could be improved by national governments: **political engagement/transparency and stability, access to education, basic services, healthcare, quality data, and community engagement.** Reversely, challenges like poverty, housing, unemployment, migration, cost of living, rapid urbanization, and poor environmental conditions can hinder their adaptive capacity.

Under2 Coalition

The Under2 Coalition is driven by a group of state and regional governments committed to keeping global temperature rise well below 2°C. As a reminder, the Under2 MoU has been adopted by 12 states and regions prior to COP21, and signatories have made a commitment to reduce greenhouse gas emissions by 80-95% below 1990 levels, or to 2 metric tonnes per capita, by 2050. The Climate Group acts as the secretariat of the Under2 Coalition and works in partnership with the CDP for the Annual Disclosure.

2019 Evolution and deliverables

In 2019, the Under2 Coalition brings together more than 220 governments in 44 countries who represent over 1.3 billion people and 43% of the global economy. Since 2015, the number of reporting states and regions has grown from 44 to 124, with 28 of these publicly disclosing in all five years. This year the report shows that disclosing states and regions have, on average, reduced their emissions since their baseline year by over 14%, which is more than twice that in 2015 (tab. 3). **These +120 regions represent now around 5 GT (gigatons) of CO₂ equivalent, 1/8 of the global GHG emissions.**

3 governments - Attica, Lombardy, and California - have already achieved their 2020 targets, and 9 others are approximately 80% or more of the way there. Beyond that, states and regions need to increase the ambition of their emission reduction targets for 2030 and 2050 in order to stay in line with the goal of the Paris Agreement.

TABLE 3

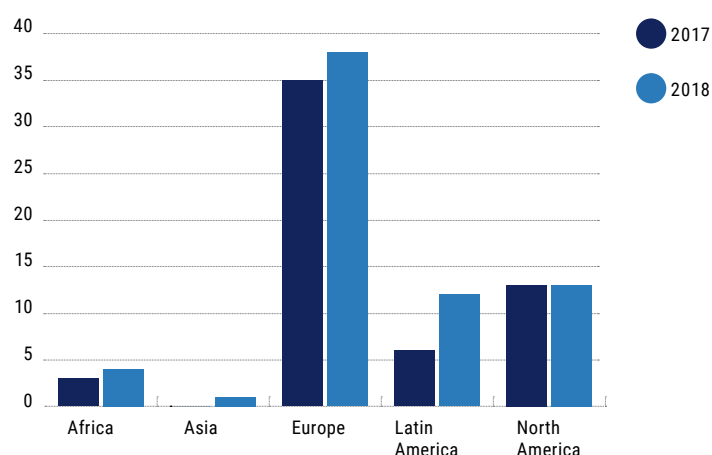
EVOLUTION OF REPORTING ELEMENTS BY REGIONS AND STATES TO CDP'S PLATFORMS

Source: Annual Disclosure Reports, Climate Group, CDP

	Regions reporting climate-energy data	Represented inhabitants in millions	Represented emissions	Average decrease in ghg emissions compared to base year	Actions
2015	44	325	2.8 Gt CO ₂ e	6%	348
2016	62	440	3.1 GtCO ₂ e	6.3%	1,299
2017	110 (including 53 from Under2 Coalition)	658	3.9 GtCO ₂ e	8.5%	2,329
2018	120 (including 78 from Under2 Coalition)	672	5 GtCO ₂ e	9%	3,097 (including 295 on adaptation).
2019	124	669	5 GtCO ₂ e	14,2%	3,562

In 2018, Latin America made the most significant progress by publishing 12 inventories (in Mexico, Brazil, Peru), compared to 2017 when they published six (fig. 12).

The Climate Group report's [Appendix](#) gives details on the data published in 2018 by the different regions: emission reduction, energy efficiency, and local renewable energy targets. 11 Under2 Coalition member regions disclosed for the first time their inventory of GHG emissions to the CDP, as well as their base years to observe evolutions (Table 5).

FIGURE 12REGIONS HAVING PUBLISHED THEIR REGIONAL DATA ON GHG EMISSIONS - *Data Source: CDP database 2018***TABLE 4**

EMISSIONS EVOLUTION OF NEWLY REPORTING MEMBERS OF THE UNDER2 COALITION

Source: Global States and Regions Annual Disclosure 2018 - Annexe

Government	Base Year	Inventory Year	Percent change from Base Year
Abruzzo	2006	2012	-18%
Acre	2010	2012	-73%
Attica	2008	2015	-25%
Azores	1990	2014	+60%
Estado de Mexico	2010	2015	-22%
Jalisco	2010	2014	-32%
North Brabant	2010	2016	-2%
Rhineland-Palatinate	1990	2015	-37%
Rio de Janeiro State	2005	2015	+40%
South Australia	1990	2015-16	-20%
Western Cap	2009	2015-16	+3

Under2 Coalition programmes and actions

Industry Transition Platform (ITP): Continuing its work with highly industrialized regions from the Under2 Coalition, the Climate Group has launched the ITP to build on the work of the Energy Transition Platform, which concluded in May 2018. The ITP will support governments develop innovative, impactful, and ambitious strategies to achieve deep emission cuts of heavy emitting industries, and to inspire other Under2 members to undertake similar actions. Representatives from industry, system change experts, and research partners will provide participants with tailored support to improve their knowledge on how to stimulate industrial emission reductions, support future industry growth and productivity, and increase their capacity to drive transformational change through government interventions and industry relationships. The Industry Transition Platform – a joint initiative of the Climate Group and the Government of North Rhine-Westphalia, funded by Stiftung Mercator – runs from April 2019 to July 2021.

[Under2 Methane Project](#), a more specific project, is a forum for state and regional governments around the world to share effective ways to reduce methane emissions, starting with a focus on the oil and gas sector. The Under2 Methane Project explores both proven and emerging approaches to measure and reduce methane emissions from around the world, including regulations, incentives, and collaborative projects adopted in places such as British Columbia, California, Washington (state), and Mexico, among others.

[ZEV \(zero emissions vehicle\) Community](#), the latest Under2 Coalition initiative on transport, supports governments as they increase the number of zero emission vehicles on their roads. The initiative brings all levels of governments together through a series of webinars to share and learn about ZEV initiatives taking place around the world. The ZEV Community is co-hosted by the Under2 Coalition and the ZEV Alliance Secretariats (the Climate Group and the International Council on Clean Transportation) in partnership with C40 Cities and the U.S. Climate Alliance. All participants and members of these networks are invited to take part in the ZEV Community.

To gauge the effective action of Under2 members, projects are also shared on the [Under2 Coalition Policy Action Map](#), which now includes 42 case studies of implemented policies such as:

- Since 2011, the Welsh Government's [Warm Homes Programme](#) has invested over £240 million (€278 million) to improve the energy efficiency of over 45,000 homes inhabited by low incomes households;
- With a total budget of \$18 million (€12.3 million), the [International Climate Cooperation Program](#) of Québec government supports mitigation/adaptation projects of local organizations in francophone countries.
- Santa Fe in Argentina has implemented a new [Bio Bus initiative](#) that uses 100% solar electricity to power two bus lines in Rosario, with electricity generated in nearby San Lorenzo.
- Baden-Württemberg has established the "[Cluster Electric Mobility South-West](#)" alliance to connect stakeholders from industry and research to develop abilities for new products and services in Baden-Württemberg.

The collaboration between members continues to be supported by the Future Fund established in 2016 with the aim of empowering subnational governments to accelerate their 2°C policy. It enabled in 2018 ([Future Funds Progress Report 2018](#)):

- The State of West Bengal (India) renewed its State Action Plan on Climate Change including its adaptation strategy, data and emission scenarios, and targets aligned with India's Nationally Determined Contributions.
- In Mexico, the State of Yucatán set up a reporting-verification (MRV) system of its mitigation programme as part of its Carbon Management Plan.
- Peer learning secondments that facilitated collaboration on climate action: officials from Western Cape Province (South Africa) travelled to California to re-evaluate the adaptation strategy concerning the impact of fires and droughts. The State of Gujarat (India) visited South Australia to be inspired by their strategy for low-carbon infrastructure development (planning, electric transport) and resilience, particularly to address the issue of power cuts.

CLIMATE PERFORMANCE AND SOCIO-ECONOMIC BENEFITS GO HAND-IN HAND IN INDIA

The Under2 Coalition Secretariat, in partnership with the MacArthur Foundation, launched a programme in 2018 to identify the synergies between India's Nationally Determined Contribution and the actions of Indian states. In doing so, the "[Driving Climate Action: State Leadership in India](#)" 2019 report analyses both the Indian states' performances in climate action and their correlation with the socio-economic indicators of their region. This led to the following conclusions:

The 10 best-performing states in climate action implementation are the 10 states with the highest per capita income,

The correlation is low between states with high per capita income and high per capita emissions intensity.

The best-performing states in climate action make a bigger contribution to the national GDP, and have lower emissions intensity, improved energy efficiency, greater use of renewable energy potential and a higher percentage of forest cover growth.

This report concludes that improving incomes of people in developing countries is not at odds with a low-carbon future.

RegionsAdapt

The RegionsAdapt initiative aims to support regional governments to take concrete action, collaborate and report on climate adaptation. The Secretariat of the initiative is Regions4 (formerly known as nrg4SD), a global network that solely represents regional governments (states, regions and provinces) before UN processes, European Union initiatives and global discussions.

RegionsAdapt now counts 71 members (70 in 2017), as Scotland recently joined the global initiative. The [2018 Brief Report](#) indicates that 38 regional governments disclosed their data on climate risks and adaptation action through CDP's States and Regions Platform.

Almost all of them started to face physical risks associated with the impacts of climate change. Only three regions could not affirm they face risks, mainly because a lack of information on climate change impacts and the missing assessment of risks.

The most reported impacts from climate change report are, by far, more frequent and/or intense rainfall and/or heat waves (fig. 13).

Beyond the vulnerability assessment, more than 50% of disclosing regions have an adaptation strategy or plan, and 10% are currently developing one. In 2018, 6 adaptation plans were published or reviewed (fig. 14). In total, 165 different adaptation actions have been reported, mostly in the implementation or operation phase (fig. 15). Most of them are about risk monitoring, community education and the integration of climate change into long-term planning documents.

FIGURE 13
CLIMATE CHANGE
IMPACTS MOST
COMMONLY
REPORTED BY
DISCLOSING
GOVERNMENTS

Source: RegionsAdapt 2018
Brief Report

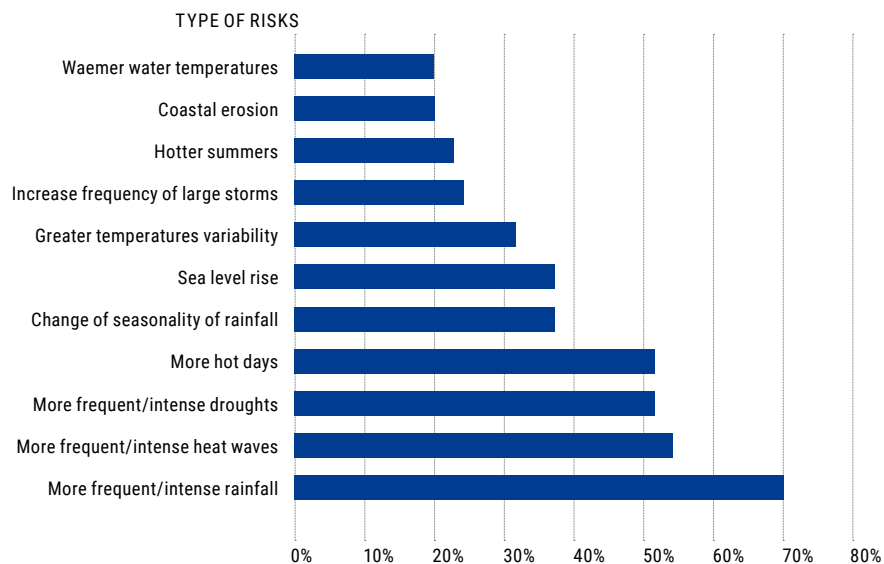


FIGURE 14

**PUBLICATION YEAR
OF ADAPTATION PLANS**

Source: *RegionsAdapt 2018*
Brief Report

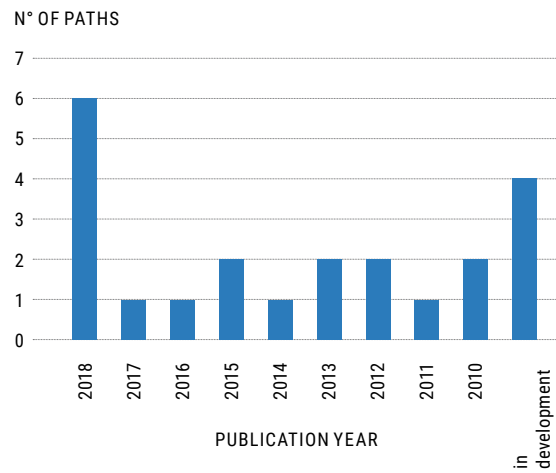
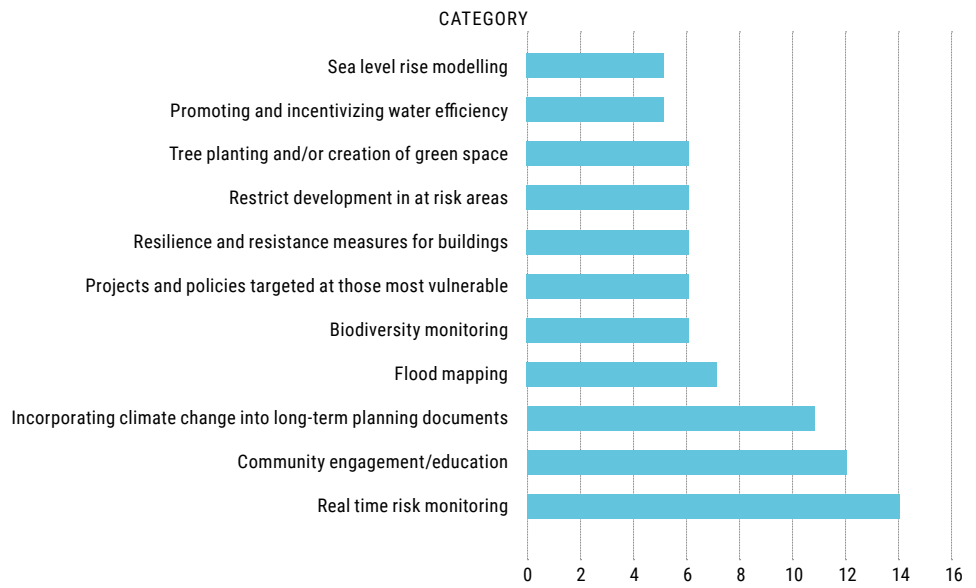


FIGURE 15

**TYPES OF MOST
UNDERTAKEN
ADAPTATION
ACTIONS**

Source: *RegionsAdapt*
Brief Report



International climate networks for cities and regions

ICLEI – Local Governments for Sustainability

ICLEI – Local Governments for Sustainability is a global network of more than 1,750 local and regional governments committed to sustainable urban development. Active in 100+ countries, ICLEI influences sustainability policy and drive local action for low emission, nature-based, equitable, resilient and circular development. Its Members and team of experts work together through peer exchange, partnerships and capacity building to create systemic change for urban sustainability.

Climate diplomacy and advocacy

This year (2019), ICLEI made of multilevel climate action a pillar of its climate diplomacy calling for intelligent partnerships with national and intermediaries' governments, particularly on knowledge and data-sharing and an integrated monitoring-evaluation system. **This is summed up in a simple message: by integrating the inputs from subnational governments, national governments will be in a better position to align NDCs with the 1.5°C target and adaptation needs.** ICLEI stresses the fact that the Talanoa Dialogue has been a first step to explore leads for institutional collaboration between national and local levels, now calling for concrete tools, law and practices ([Leveraging subnational action to raise climate ambition](#), 2019). As a focal point for the Local Governments and Municipal Authorities (LGMA) constituency, ICLEI reported in "[From Talanoa Dialogue to NDCs: Shifting climate ambition through multilevel action](#)" the outcomes of COP24 for local and regions' governments, such as the relevant decisions for cities and regions adopted by the Parties (Paragraph 37 of Decision1/CP24; Paragraph 9 of Decision 4/CP.24; Paragraph 10 of Decision17/CMA.1), and the references in the Rulebook to the role of local governments in the implementation of NDCs.

A second pillar is the wider importance given to adaptation into the local governments' climate policy and reporting process. As mentioned above, based on the carbonn® Climate Registry (cCR), [Data speak louder than words](#), published with C40, SDI, and UN-Habitat, proposes few takeaways advocating for better consideration of subnational actions and support: the share of adaptation actions funded by local sources, an outlook of the progress made by cities in adaptation planning, the barriers and factors enhancing adaptive capacity identified by local governments themselves, etc. Lastly, it proposes a series of recommendations for the recognition of the mandate of local and regional governments by national plans to ensure communities' resilience by integrated reporting, quality data access and measurement. The recognition needs to come along with improved access to finance and the quantification of benefits of adaptation action (avoided costs) to make a business case to public and private actors.

Capacity building, knowledge sharing, and implementation

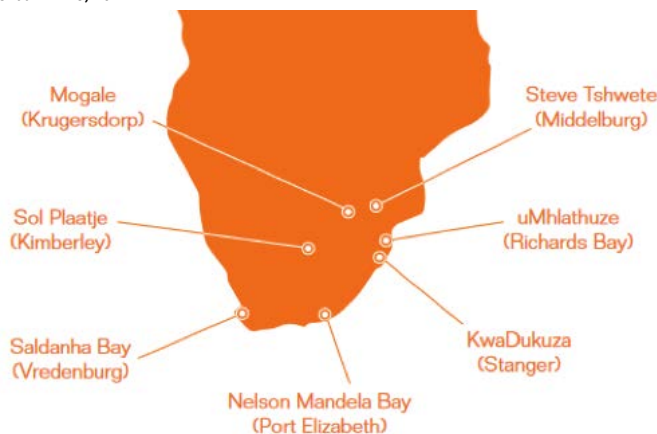
ICLEI's programmes and the action of participating cities show the diversification of the tools and dimensions of public action relating to climate action. Themes such as the integration of nature and the valuation of ecosystem services are gaining in importance, as are joint actions on biodiversity and the conservation of natural environments. As for the means of implementation, such as the creation of a platform for public-private cooperation between local authorities and companies, or the growing interest in creating a reference framework for "green public procurement", these show the need to reform contractual relationships between local authorities and private actors.

- [CitiesWithNature](#) – A global exchange platform launched by ICLEI, the Nature Conservancy and IUCN in June 2018. A year later, the platform gathers 64 city profiles on the 5 continents. The platform launched in 2019 its first tool "[Nature Pathway](#)", a series of guides and case studies to help cities identify and integrate nature-based benefits into their policies. As for members' deliverables, Melbourne has published its "Nature in city" action plan; Dar es Salaam has undergone a [mapping of their natural assets](#) supporting the city's policies and action to protect nature and enhance its benefits, crossing land cover spatial data, local expertise, recent literature etc.

FIGURE 16

MAP OF COMMUNITIES BENEFITING FROM URBAN LEDES PROGRAM IN SOUTH AFRICA

Source: *Urban LEDES, 2019*



- [Urban LEDES II](#) – promotes Urban Low Emission Development Strategies (Urban LEDES) in 68 cities/towns in Brazil, India, Indonesia and South Africa (phase I), and in Colombia, Bangladesh, Lao PDR, and Rwanda.

At the national level, the project supports vertical integration (multi-level governance) through the reporting of local climate action into Nationally Determined Contributions and their access to climate finance. Among the recent deliveries: in Lao PDR, a [vertical Integration study](#) maps the institutional and policy landscape and connections with key actors; in South Africa, Saldanha Bay met

Stellenbosch to engage on the barriers and enablers of off-grid electrification in low-income communities and informal settlements. More training activities are regularly reported on the [Urban LEDES website](#).

In 2019, 6 South African communities (fig. 16) projects have been showcased, giving practical examples of low emission solutions ([Urban LEDES, 2019](#)). Local involvement determined the nature, scale and approach of each project, and different solutions were implemented: wonderbars, composter, mobile LED solar light, urban food gardens, etc. These LEDES also provided for basic needs such as efficient lighting systems in libraries, classrooms, kindergartens, or improved environment for workers.

- [City Climate Planner Program](#) (CCPP) is an initiative designed to lower the barrier of entry for cities looking to participate in climate action by providing an affordable way to train city staff on how to prepare inventories and make use of them. It provides research, reports and online training covering GHG emissions inventories.

BOX 7

HOW CAN CITIES CREATE CIRCULAR JOBS? EXAMPLES FROM BALTIMORE, RECIFE, AMSTERDAM, ETC.

Based on recent studies, UNEP and ICLEI highlight in "[How can cities create circular jobs?](#)" the wide variety of jobs created in waste management, services and repair sectors, and anywhere the composition of the industry is changing (construction, energy production and distribution, manufacturing of electronic and textile products, agriculture), with the following main lesson: while some cities are building locally-specific models for employment within the circular economy, they have no clear roadmap of this process. However, monitoring jobs in the circular economy would help cities track their progress in addressing both the unsustainable material consumption (60% in cities) and growing employment needs.

For example, Baltimore, with its Waste-to-Wealth programme, supports businesses making new products from waste stream and seeks to create jobs in anticipation of the city's population growth. Baltimore made of deconstruction a required component of housing demolition contracts while fostering the training of unemployed people in the construction industry.

The job creation potential is also observed by Circle Economy in "[The Role of Municipal Policy in the Circular Economy](#)" (2019) which looked at 43 European cities and concluded that regulatory and economic intervention is the most efficient way to create jobs in a circular economy, along with financial and technical support (loans, subsidies, networks, etc.) to overcome financial barriers to set up new activities, which can result in tangible socio-economic benefits for the city and its people: more than 700,000 jobs in Europe by 2030.

- [The Urban Transitions Alliance Roadmaps](#) support industrial legacy cities in their transition by identifying shared challenges and potential collaborations on solutions. This network of 11 post-industrial cities formulated in 2019 the "[Urban Transitions Alliance Roadmaps](#)", which details four transition pathways, each illustrated with case studies and solutions implemented by cities:

1. Reusing and Redeveloping infrastructure for urban renewal (Gelsenkirchen and Dortmund, Katowice, Baltimore, Beijing);

2. Establishing sustainable energy systems with energy efficiency (Buffalo, Katowice, Pittsburgh, Beijing);

3. Overcoming barriers that prevent a modal split in mobility (Shijiazhuang, Essen and Dortmund, Cincinnati and Buffalo);

4. Including communities by reconnecting citizens to resources at the local level (Pittsburgh, Cincinnati, Buffalo, Baltimore, Essen).

- The [Global Lead City Network](#) (GLCN) on sustainable procurement is a group of 14 cities committed to driving the transition towards sustainable consumption and production through innovative procurements. It enables the cities to showcase quantified targets in four priority sectors to share and develop the abilities to implement sustainable purchasing practices. The [12 detailed case studies](#) available describe the achievements of cities in implementing green public procurements: Auckland, Budapest, Buenos Aires, Cape Town, Denver, Ghent, Helsinki, Montréal, Oslo, Quezon City, Rotterdam, Seoul, Tshwane.

- CiBiX, ICLEI's City-Business Collaboration Platform, helps foster connections between our

global network of cities and the private sector on key sustainability challenges and opportunities. Recent CiBiX engagement workshops helped accelerate public-private dialogues on low emission transport in Pasig City (Philippines) and low-emission energy in Jakarta (Indonesia).

Finance

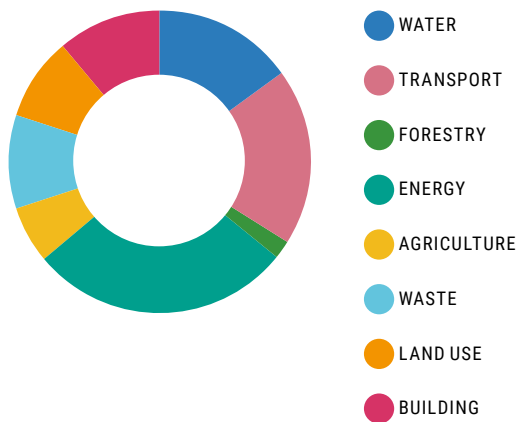
Transformative Action Program (TAP): Launched in 2015, its aim is to act as a project incubator to catalyse and improve capital flows to cities, towns and regions, thereby accelerating low-to-no emission and climate-resilient developments while supporting national ambitions through 8 transformative local infrastructure projects. As exposed in the 2018 Edition – “the first phase in 2015 received 124 projects from 41 countries, representing a required investment of approximately \$9 billion, demonstrating the urgent need for funding in the territories”.

As of October 2019, ICLEI registers 23 “tapped” projects that are implemented or have obtained access to finance. Together with the projects received through the second call for proposal launched in September 2018, the TAP pipeline currently counts 45 projects, with an investment potential of 2.3 billion euro. Most of them are related to energy (15) and transport (10), and located in Latin America and Caribbean (20) (fig. 17):

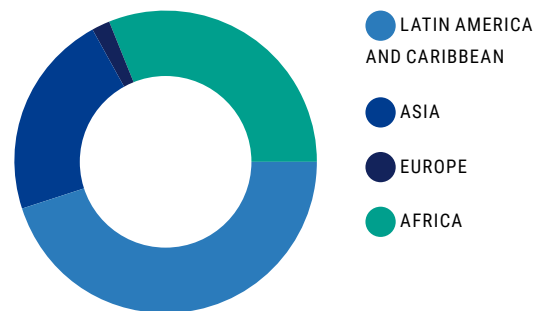
FIGURE 17

TAP PROJECTS IN THE PIPELINE AS OF SEPT 2019 - *Source: TAP, 2019*

SECTORAL DISTRIBUTION



REGIONAL DISTRIBUTION



C40 is a network of the world's megacities created in 2006 by the former Mayor of London, Ken Livingstone. The organisation's headquarters are in London, and it is chaired by the current Mayor of Los Angeles, Eric Garcetti, while Michael Bloomberg is President of the C40 Board of Directors. From 40 members in 2006, and 80 during COP21 in 2015, C40 gathered in 2018 94 cities throughout the world, representing 650 million inhabitants (8.3% of the world population) and 25% of the global GDP.

BOX 8
GHG REDUCTION RESULTS OF C40 CITIES

In 2019, 4 additional C40 cities announced they had peaked in terms of their GHG emissions: Athens, Austin, Lisbon and Venice. A city is considered reaching the "peak" of GHG emissions when a decrease of emissions is observed for the past 5 years and at least by 10% compared to the highest point. These 4 cities add up to the 26 other members that reached a peak in 2018. The total of 30 cities represents 58 million urban citizens.

Last year, *Consumption-based GHG emissions of C40 cities* revealed that the consumption of 79 cities amounted to 3.5 GtCO₂e, 60% higher than the emissions from their production by local activities (2.2 GtCO₂e), meaning that two thirds of their emissions are due to imports, particularly for high-income cities. [The Future of Urban Consumption in a 1.5°C World](#) updates these numbers and finds that consumption-based emissions from nearly 94 of the world's biggest cities already represent 10% of global GHG emissions, whilst their total production-based emissions in 2017 are estimated at 2.9 GtCO₂e. These emissions are mostly hidden in territorial GHG inventories since 85% of the emissions associated with goods and services consumed in C40 cities are generated outside cities.

Urban consumption-based emissions could double by 2050 but must be cut by – at the very least – 50% by 2030 (two-thirds for high-income cities) in order to maintain the possibility of keeping global temperature rise below 1.5°C. The report thus explores six sectors where leaders, businesses, and citizens in the world's cities can take rapid action to address consumption-based emissions and save 1.5 GtCO₂e/year by 2030: food, construction, clothing, vehicles, aviation, and electronics.

Source: C40, Arup, Leeds University, [The Future of Urban Consumption in a 1.5°C World](#).

This year, C40 publications stressed the need to quantify economic advantages of the transition. As urban areas will gain in population and therefore in weight in the fight against climate change, more frequent socio-economic impacts analyses for climate planning are essential to make a stronger case for climate action at the local level, and policy support at the national level. **This focus is not only about scenario and future impact analyses, but also about creating a policy framework systematising the quantification or the appreciation of socio-economic benefits within urban climate actions.**

[Climate Opportunity: More Jobs; Better Health](#), makes a robust case for local policymakers as to why climate action benefits extend far beyond the climate arena. **The paper's intent is to demonstrate how the 3 sectors of building retrofits, bus networks, district energy and cooling, can vastly reduce carbon emissions (1,242 MtCO₂) globally and deliver effective economic and public health benefits:** generating around 13.7 million jobs; saving households billions of dollars and 40 billion hours of commuters' time; and potentially prevent by 2030 nearly 1 million of premature deaths related to urban pollution or traffic fatalities, and additional 300,000 by setting district-scale

renewable energy for heating and cooling in buildings. Health benefits are particularly urgent to reach since 97% cities in low- and middle-income countries with more than 100,000 inhabitants do not meet World Health Organisation air quality guidelines. [Toward a Healthier World C40 and Johnson & Johnson](#), a C40 cutting-edge report, demonstrates the air quality and health benefits of climate action, working to date, with 26 cities to measure potential health gains.

Positive impacts could vary between regions and countries at different stages of economic development and could be greater for lower income groups in cities in developing countries, where populations often have the most to gain from the introduction of new technologies and practices.

Mitigation measures are often planned and assessed in isolation in climate-related policy silos, where comparative cost of measures is the primary assessment criteria. However, when significant developments are observed in climate change policy, they are often not driven by climate change planning, but by various aspects of the city-level and national development agendas which happen to have synergies with climate change mitigation outcomes. **Informing planning processes with wider impacts can maximise the synergies with different development priorities rather than just looking at upfront capital costs in isolation for example.**

The development of an [Urban Climate Action Impacts Framework](#), supported by 15 C40 member cities and experts from sixteen NGOs, international governmental organisations, consultancies, and think tank organisations, illustrates how climate actions are linked with SDGs, or how urban life is highly interconnected, as the environment, society and economy all impact each other (both positively and negatively) in complex dynamics (RAMBOLL & C40, 2018). The report is a user guide for local governments with common principles, taxonomy and guidelines to approach the mapping and assessment of those wider impacts and the SDGs. It built on existing methodologies and frameworks.

Concrete examples are given in [Municipality-led circular economy case studies](#) published by the C40 and Climate-KIC within the project Circular Cities, providing over 40 examples of how practical circular economic initiatives are implemented by cities, and the wide range of levers that cities can use to facilitate circular economy at the city-wide scale (1), for urban refurbishment (2), within public procurements (3), of the city's utilities activities (4) and between citizens and actors (5).

These case studies offer several trends of action and key takeaways:

- This relatively new field suffers from the lack of specific goals and indicators in the circular economy for cities to quantify their progress.
- Cities are testing a new approach, such as initiating living labs for grassroots solutions in regeneration districts or renting rather than purchasing goods through public procurement to uncover operational savings and promote new business models by contractors.
- A growing number of cities adopt strategies to become minimal or zero-waste, translated in more specific plans and policies, both at city and district levels, and in clear guidance to all departments to put their strategies into practice daily.

Various practical solutions are showcased: a scan of the material flows in the city (Amsterdam), green procurement criteria and services collaboration for optimal jobs creation (Brussels), helping to link industries to share inputs and outputs between each other (Cape Town), facilitating practical initiatives in businesses of all size to open up new revenues streams or realize financial savings (Glasgow). Some municipalities adopt a broader vision of the circular economy, such as Samsø that seeks to be bio-circular after they achieved 100% self-sufficiency, by closing loops in as many value-chains as possible, or such as Toronto, that tests an economy procurement framework with

a clear set of evaluations that could fit all City procurement (Toronto).

BOX 9**ADDRESSING CHINA'S DRAMATICALLY GROWING BUILDINGS SECTOR: 5 PIONEERING CITIES**

The building sector represents 25% of China's GHG gas emissions and 20% of total energy consumption. It more than tripled between 2001 and 2016 from 300 MtCe (million tonnes of coal equivalent) to 906 MtCe. They are mostly consumed by cities, with 80% of primary energy and 64% of CO₂ emissions in China's building sector. From 2001 to 2016, existing building floor area had grown from 31.5 to 58 billion m² – meaning the equivalent of 53 times New York City's floor space was added over that period. It should grow by 2 billion of m²/year until 2050. For now, coal and natural gas remain the primary fuels consumed to power and heat buildings in China, with 72% of the electricity used for power and heat for buildings coming from thermal power plants. In addition, the surge in real estate and infrastructure construction saw emissions from steel and cement expand rapidly and become one of the major factors of China's emissions increases ([Carbon Brief](#), 2019).

C40 China Buildings Programme (CBP) is one of country-level initiatives integrated within the C40s global Building Energy 2020 Programme (BE2020), that supports more than 50 cities to take action and develop policies that urgently reduce emissions from existing buildings) gathering Beijing, Fuzhou, Qingdao, and Shanghai (Changning District). The "[Constructing A New, Low-Carbonnew, Low-Carbon Futurefuture](#)" report outlines the existing initiatives of those 5 cities.

Regions4 (formerly nrg4SD)

Regions4 is officially recognised before the United Nations (UN) system: UNFCCC, CBD, NEP and UNDP, as well as the European Union. It helps its members strengthen their inter-national influence and local governance capacities regarding several sustainable development themes. Specifically, the network supports and co-funds exchanges of expertise, partnerships and cooperation projects among its members, and with international partners. Thereby, the network helps its members deploy and strengthen planning and territorial governance tools in its three sectors of activity: biodiversity, sustainable development and adaptation to climate change.

Formerly nrg4SD, the network consisted in 2018 of 42 subnational governments and associations of subnational governments from 20 countries worldwide. Its activity is structured in 3 pillars: Regions4Climate, Regions4Biodiversity, and Regions4SDGs.

Regions4 Climate

In addition to the RegionsAdapt initiative described above, Regions4 members participate in other climate-related programmes. The Regions4 [Visiting Experts Program](#) fosters bilateral cooperation, capacity building and knowledge transfer among Regions4 members. In 2018, Québec (Canada) and Gossas (Senegal) shared a learning experience on climate change, renewable energy and energy efficiency, biodiversity and forestry. In addition, Regions4 is an official partner of the [BreatheLife Campaign](#), in which 9 member regions participate. The campaign is a call for action to mobilise subnational governments and individuals to take action and set air quality targets, while improving public health and slowing the rate of climate change, launched by UNEP, WHO and the Climate and Clean Air Coalitions.

Regions4 Biodiversity

[The Advisory Committee on Subnational Governments and Biodiversity \(AC SNG\)](#) is a permanent structure of the Convention on Biological Diversity launched in 2015 and coordinated by Regions4 and the government of Québec (Canada). Its 20 members have facilitated the recognition of the important role regional governments play in the development and implementation of decisions related to global biodiversity. In parallel, the [Regions for Biodiversity Learning Platform \(R4BLP\)](#), launched in 2016, provides a collaborative environment for cross-jurisdictional exchange, mutual learning, and technical capacity-building. Its reports and contributions aim to share key findings that help shape the post-2020 global biodiversity framework and prove the significance of decentralized initiatives to achieve the goals of the Convention. As of 2019, the platform counts 12 active members and has conducted a dozen webinars.

The 2018 Report "[Global Challenges, Regional Solutions](#)" contains case studies and experiences from Wales' (United Kingdom) recent legal framework and its tools such as the Environment Act 2016 or the Nature Fund Pilot Scheme, Lombardy's (Italy) LIFE Gestire 2020 channelling public and private funds, Basque Country (Spain) and the role it has given to the three provincial and local councils in the implementation of its Biodiversity 2030 Strategy, as well as experiences from São Paulo (Brazil), Québec (Canada), Palawan (Philippines), and Catalonia (Spain).

Regions4 SDGs

Regions4 represents the voice of regional governments in the 2030 Agenda, and during the annual reviews of the progress towards the achievement of the SDGs at the United Nations High-Level Political Forum (HLPF). The “Localisation of the SDGs” initiative gathers 29 active regions, organising intervention, events and webinars to share experiences on the implementation of the SDGs.

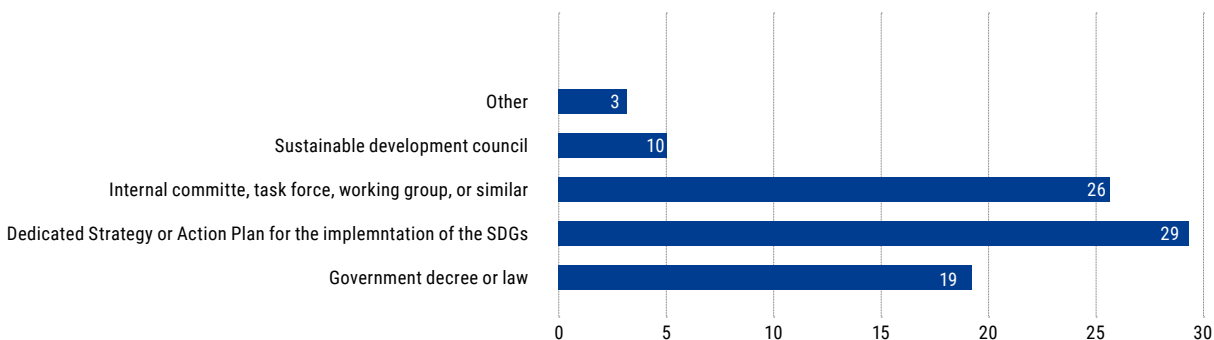
The 2018 Report “[Localizing the SDGs: Regional Governments Paving the Way](#)” maps the process undertaken by 47 regional governments across the globe in the implementation of the SDGs and stresses a set of clear overall policy recommendations and approaches that could be replicated by regional governments:

- 92% of respondents declared being familiar with the SDGs and in early or advanced stage of implementation, and 87% declared having a specific policy and/or action to implement the SDGs;
- Among the most common instruments and actions adopted to enable the realization of the 2030 Agenda, around 70% have a dedicated strategy or action plan for the SDGs, and nearly 65% have established an internal committee, task force, working group or similar (fig. 18);
- It is possible to identify a common process that guides the implementation of the SDGs: defining a vision, mapping existing governance structure, adopting a policy, enacting laws, and creating and/or adapting institutions. The most common obstacles include the difficulty of prioritising the SDGs over other agendas (cited by 45% of regions) and the need for technical and financial support;
- Attention given by regional governments to multi-level governance and multi-stakeholder engagement reveals their concern for ensuring greater accountability, ownership and coherence in the implementation process:
 - 71% have undertaken or foreseen a process of consultation with civil society, universities, private sector and other stakeholders;
 - 85% have conversations, projects or joint actions with the respective central government in relation to the implementation of the SDGs;
 - 81% have developed or planned collaborations, joint events or other activities to build capacities and support local governments in their respective region.

Lastly, according to the report, what distinguishes the contribution of regions in the implementation of the SDGs is their capacity to undertake an integrated territorial approach which addresses multiple SDGs and their interlinkages. They also look at indicators and proper data that will not only allow follow-ups and reviews at territorial level but also feed into national voluntary reviews.

FIGURE 18

INSTRUMENTS REPORTED TO IMPLEMENT THE SDGS - *Source: Regions4 Report*



European initiatives and networks

Energy Cities

Governance: Integrating cities and citizens into respectively national and local climate strategies

The [LIFE PlanUp report](#) presents and scores good practice examples in the form of case studies from seven EU Member States – France, the Netherlands, Sweden, Luxembourg, Ireland, Germany and Estonia – as well as Canada and the US State of California. In these examples, the multilevel climate and energy dialogue required by the EU regulation governing the National Energy and Climate Plans (NECPs) ([i.e. Article 11 of the Energy Union and Climate Action Governance Regulation](#)) has been successfully developed and scored out of 100 by the report based on: political commitment, institutional collaboration, governance structure, stakeholder engagement and involvement, action, transparency, adaptability, replicability, and effectiveness (table 5).

TABLE 5

10 GOOD PRACTICES OF LOCAL ACTORS AND CITIZENS INTEGRATION, ANALYZED AND SCORED BY ENERGY CITIES

Source: *Energy Cities, LIFE PlanUp report, 2019*

France: National Debate for 2015 Law on the Energy Transition for Green Growth	93
Netherlands: Stakeholder roundtables for national climate agreement	92
Sweden: Parliamentary Committee with stakeholders for Long-Term Climate Policy Framework 2017	92
Luxembourg: Climate Pact between State and municipalities	91
Ireland: The National Dialogue on Climate Action	87
Germany: National Dialogue for 2050 Climate Action Plan	84
Estonia: Stakeholder working groups for 2050 Principles of Climate Policy	83
California: Stakeholder inclusion in Global Warming Solutions Act	88
Canada: Pan-Canadian Framework on Clean Growth and Climate Change	77

In the Netherlands, within the “Stakeholder roundtables for national climate agreement”, discussions on each of the sectors that will have to contribute to the achievement of 2030 GHG reductions goals are held in the format of stakeholder roundtables. A Climate Council was set up to manage and coordinate a large-scale negotiation and debate process with stakeholders to reach the national climate agreement. It consists of representatives of the various stakeholders.

These good practices have not been systematised and the current lack of multilevel dialogue and recognition of cities in the National Energy and Climate Plans (although required from UE Member States, see Box 2) contrasts with cities’ effort to overcome traditional top-down methods for new governance schemes in order to help reshape public policy towards the integration of citizens and local stakeholders. [“Democratic transition factory”](#) observes that the evolving of practises takes two forms:

- The direct involvement of citizens: from punctual actions (protests, etc.) to citizens and community projects (energy cooperatives) and citizens movement (Transition Towns, Alternatiba), to civil disobedience (Ende Gelände).
- The evolving role of cities: from a simple role of project leader to a role of local actors’ projects

supporter: living labs, participative policies and budgets, co-elaboration of local projects, etc.

To observe the way cities are reinforcing citizens' power into the decision-making and policy processes, the report makes in-depth analyses of 3 European cities:

- Cadiz, Spain, fights energy poverty thanks to a collaborative work with citizens and a public utility company, adopting a social rate while providing only renewable energy in the city.
- Grenoble, France, became itself an urban lab offering several tools to its citizens: participatory budget, the "independent citizen councils", and the citizens' initiative voting.
- Maastricht, in the Netherlands, set up the urban living lab M-Lab in 2012 giving the inhabitants the opportunity to co-create projects and co-learn lessons.

Energy policy: how cities efficiently support citizens' energy projects

"[How cities can back renewable energy](#)" identifies 3 practical ways for cities to effectively change the power dynamics of the energy market and influence energy infrastructure owners:

- Involving an entire district in changing its energy supply mode and consumption patterns
- Teaming up at various stages of the "energy value chain with individuals and cooperatives in identifying, financing or operating a series of heterogeneous green projects
- Engaging citizens in the local planning of energy infrastructure and policies.

BOX 10

EU CLIMATE AND ENERGY PACKAGE REQUIRES STATES TO REMOVE BARRIERS FOR ENERGY COMMUNITIES

With the "Clean Energy for all Europeans Package", citizens and energy communities across the EU will be able to easily invest in renewables and benefit from the energy transition. Their rights to produce, consume, sell and store energy are now clearly spelled out in EU legislation. In addition, the directive requires member states to assess the opportunities and barriers linked to the development of self-consumption and put in place enabling frameworks to ensure they have a fair chance to compete with other players in the market.

In 2016, two separate studies looking specifically at wind energy in Europe concluded that based on income and employment effects, community-based wind power projects contributed about 8 times more to local development than those implemented by traditional, investor-owned companies².

Source: [Energy Cities](#), 2019

Various case studies give a list of levers cities can use to bolster RE supports community-energy and local energy on their territories:

(1) as regulatory and policy enabler: Scotland proved that setting a target for locally produced and community-owned energy has led to effective response from citizens. Danish developers are required to offer a 20% ownership share to residents living near new installations, resulting today in 85,000 people being employed by the RE sector and in a 3% share of GDP. New eco-neighborhood projects can enable the growth of community energy and improve citizens' participation in

2 (1) Nikola Sahovic, Patricia Pereira da Silva, « Community Renewable Energy - Research Perspectives », Energy Economics Iberian Conference 2016. URL: https://ac.els-cdn.com/S1876610216316629/1-s2.0-S1876610216316629-main.pdf?_tid=7b451e33-04a9-416e-bc63-5e6db3c4ec90&acdnat=1547457422_f760dd9a85f872dd18429315b33d14b9#page=1&zoom=auto-18,744
(2) Institut dezentrale Energietechnologien, Universität Kassel, « Regionale Wertschöpfung in der Windindustrie am Beispiel Nordhessen », May 2016. URL: https://www.uni-kassel.de/fb07/fileadmin/datas/fb07/5-Institute/IVWL/Wetzels/Regionale_Wertsch%C3%B6pfung_in_der_Windindustrie.pdf

the energy system, as Lyon (France) has done with the Confluent district, or Eeklo (Belgium) that imposes that 30% of the grid be owned by local citizens. Dutch and British municipalities negotiate better deals from energy providers for groupings of citizens, forming a bulk purchasing of power from energy suppliers.

(2) as project partner or facilitator: Steinfurt district, Germany, set up a task force consisting of the local mayors, representatives from public utilities and the agriculture industry to establish “Guidelines for Citizens’ Windparks”, while Scotland set up a consortium with the National Energy Agency, charities, and social enterprises, to provide loan finance and grant-to-loan funding assistance. Gent, Freiburg and Vienna, developed solar and heat maps to inform residents and communities of the suitability of roofs to install solar PV panels. Local authorities can also provide “in kind” supports through access to public land, buildings and facilities, such as in Germany where most of cooperatives use roof spaces of municipalities, or in Plymouth (UK) which put 32 schools at disposal. To financially secure energy projects, the Bristol “Community Energy Fund” provides grants and loans to local community groups to cover the development costs. Gent (Belgium) provides funds for the local cooperative to hire experts.

(3) as infrastructure operator: the re-municipalisation³ movement has led German cities to create companies covering the whole value chain of production, distribution and supply, and where citizen cooperatives have sometimes been offered financial ownership and voting power, which is the case in 40% of them in Germany. This is the case of Wolfhagen’s energy utility that supported the creation of a citizen cooperative which owns 25% of its capital. Today, the utility company makes a yearly profit, the number of employees has nearly doubled, and the city reached 100% RE in 2014. Swindon’s municipal energy company in the UK partnered in 2016 with a green investment platform called Abundance to co-finance through “energy bonds” two solar wind farms, with citizens’ contribution who could receive 5% annual return after a year.

Finance: integrating climate into budgeting and financing

Energy Cities reminds the significant impacts that cities’ finances have on the success of the energy transition since local and regional authorities’ spending represent an important part of the European economy; sub-national government expenditure represented 15.9% of EU GDP in 2016 and “55% of the total public direct investment was carried out by sub-national governments” in 2014, according to the [OECD](#).

Therefore, “[Climate-mainstreaming municipal budgets](#)” provides a collection of case studies, best practices, and tools that can help local authorities align their spending and investments with the Paris Agreement by fully integrating energy and climate issues into their budgetary and financial planning:

- Environmental reporting and budgeting: combining both reporting processes helped Oslo (Norway), Paris (France) or Växjö (Sweden) plan appropriate measures, calculate the resources necessary to achieve the objectives, and follow up on how efficiently these resources were being spent.
- Green Public Procurement: green criteria also achieve cost savings throughout the product lifecycle and incentivise the development of sustainable market practices in the local economy, as shown by the examples of Barcelona (Spain), Copenhagen (Denmark) and Rome (Italy).

³ The process of bringing back under the cities’ ownership energy utilities such as district heating and heat networks.

125 CITIES EXCHANGE ON INNOVATIVE FUNDING SCHEME FOR CLIMATE POLICIES

Since 2017, the H2020-funded project “PROSPECT” enables the exchange of knowledge and experience between EU cities and regions, on innovative financing schemes for their local projects on energy and climate. All the good practice projects on the platform represent so far 422 GWh of energy savings, \$70 million of investments, and 17 MtCO₂ reduced.

Half of the funding scheme used and reported are Energy Performance Contracting, where an external organisation (ESCO) implements a project to deliver energy efficiency, or a renewable energy project, and uses the stream of income from the cost savings, or the renewable energy produced, to repay the costs of the project.

FIGURE 19

RECENT REPORTED PROJECTS OF CITIES ON THE PROSPECT PLATFORM



A fourth and last H2020 PROSPECT learning cycle starts in November 2019 and will involve cities mentors to share their experience such as Paris and its green bonds, and Albertville and its “intracting” fund. “Intracting” fund coming from “internal contracting” funds has been experimented first by the City of Stuttgart, where three public organisations and one private company – the energy department in charge of managing the fund, the municipal construction department in charge of work follow-up, the “client” department (technical department or public company) and a private consulting firm – are entrusted with project engineering. Saved energy costs made by the companies get to refinance the fund.

Source: [PROSPECT website](#), 2019

Fossil fuel divestment of municipal funds: Oslo and Copenhagen were the first capital cities divesting from fossil fuels in 2015, at the same time as Munster (Germany) which has been particularly transparent on its divesting process.

Green municipal bonds: beyond a mere source of finance, it develops the environmental staff and reporting mechanisms which make in return easier access to finance. Gothenburg (Sweden) issues green bonds every year since 2013, while Paris mentors other cities since its first green bond experience in 2015.

Local revenues and new instrument: Lausanne (Switzerland) set an energy efficiency fund for households and businesses, while Brussels (Belgium) partnered with financial institution to assist its citizens to access soft loans or guarantee. Valencia (Spain) promote the sustainable economy through grants or rewards to offset competitive disadvantages to businesses fostering good practices.

Climate Alliance

Climate Alliance is an association of European local governments created in 1990 and a member of the European Covenant of Mayors consortium. As a reminder, members commit to reduce their CO₂ emissions every 5 years, halve their per-capita emissions by 2030 (baseline: 1990), preserve tropical forests by avoiding the use of tropical wood and support the projects of their partner indigenous peoples.

As of July 2019, the network had 18 new members since the first [edition 2018 of the Observatory's Book 2](#) (24 throughout the year 2018), reaching 1,741 in July, mostly coming from Germany and Austria. Among the various achievements of Climate Alliance in 2019, we can mention the following:

BOX 12

CLIMATE ALLIANCE RELAYS RIGHTS ABUSES INDIGENOUS PEOPLES ARE SUBJECTED TO

Climate Alliance has been relaying Amazon Indigenous Peoples advocating for the recognition of rights violations they are suffering and their links with deforestation. On 17 June 2019, more than 340 civil society organisations with Climate Alliance and Climate Alliance Austria appealed to the EU to put a stop to ongoing Mercosur trade talks. The document cites the worsening human rights and environmental situation in Brazil. It requires of the EU to send “an unequivocal message to President Bolsonaro” that it will refuse to negotiate a trade deal under current conditions. A month earlier, Gregorio Mirabal, the president of Climate Alliance’s main indigenous partner organisation, COICA, gave a speech to the United Nations Permanent Forum on Indigenous Issues (UNPFII) in New York City, where he highlighted the difficult situation in which indigenous communities in Brazil find themselves under the newly elected President Jair Bolsonaro.

Source: [Climate Alliance](#), 2019.

Cooperation with COICA: The COICA’S 4th Amazonian Summit and Congress held in Macapá, Brazil, in June 2018 gathered 300 indigenous representatives. Discussions on common principles between Climate Alliances and COICA and a joint working programme for the next years were continued in autumn when a delegation of COICA board members came to Climate Alliance’s International Conference 2018 (CAIC18) in Barcelona. The Climate Alliance European Secretariat supports the rights of indigenous representatives via a legal aid fund and encourages a variety of indigenous-led initiatives and programmes throughout Amazonia: in 2018, “Solar Lamps” and a [workshop](#) on renewables for indigenous communities.

Working groups on adaptation, finance and CO₂ monitoring: The first joint meeting of the [adaptation](#) and [finance](#) working groups has been held in CAIC18 focusing respectively on nature-based solutions and their assessment of costs and benefits, and innovative financing solutions for retrofits and renewables. As for the Working Group on CO₂ Monitoring, it had its first exchange with municipal representatives throughout Spain. Members reflected on how their experiences in countries like Germany, Luxembourg and Italy apply to the Spanish reality.

Among recent Climate Alliance’s campaigns and projects, all [available here](#), we can mention:

- Climate Active Neighbourhoods (CAN) places a focus on underprivileged communities throughout northwest Europe with buildings in need of renovation. In practice, the team project organises

tours, energy walks and home visits to value and encourage the replication of accessible retrofitting solutions for Europeans facing energy poverty.

- City Cycling where participating cities and towns choose 21 consecutive days between May and September to compete by covering as many kilometres as possible. It gathered 885 municipalities and almost 300,000 cyclists (both increased by 32% in 2019 compared to 2017).
- “RADar!”, an online platform that allows local authorities and cyclists to work together, with cyclists able to pinpoint problems, is now used by 352 municipalities (almost 100 more cities than in 2018).
- Green Footprints campaign has been helping children across Europe learn about the impacts of their daily actions on the climate. Over 1,200 schools participated in 9 countries, involving 150,000 children who collected 2,270,000 units called footprints with their daily eco-friendly habits.

BOX 13

MORE THAN 300 MAYORS ENGAGE AND CALL STATES TO PEAK EMISSIONS IN 2020

Climate Alliance members have led a broader movement pushing cities to declare the state of climate emergency. The network issued a template for a municipal resolution that has been followed by more than 500 cities. Most Climate Emergency Declarations call for zero carbon by 2030. In parallel, in Germany, the three city networks active in Europe (Climate Alliance, Energy Cities and ICLEI) have written an appeal to Chancellor Merkel for resolute climate action. “There is a massive difference between what the German Federal Government formulates as a goal and what is implemented at national level. Many municipalities have been striving for ambitious climate targets for a long time. We will all make better progress if we take this issue seriously and if we work together,” emphasises Andreas Wolter, Mayor of the City of Cologne and President of the Climate Alliance city network (Energy Cities, 2019).

In parallel, momentum for a net zero EU by 2050 continues to grow. An incredible amount of 328 mayors from 22 countries in Europe have now signed the joint letter calling for a peak in emissions next year, halving emissions by 2030 and achieving net-zero emissions by 2050 (Energy Cities, 2019). They were 210 before the European Council Summit in Romania May 9th, asking EU Members States to achieve net-zero emissions by 2050, to oversee a swift energy transition, and to end fossil fuel subsidies (Cities Today, 2019).

European Energy Award

Governance and features

European Energy Award (eea) launched in 1988 is a management and award system for municipalities and regions. It supports local authorities in establishing action plans and implementing energy and climate policy measures through the rational use of energy and increased use of renewable energies.

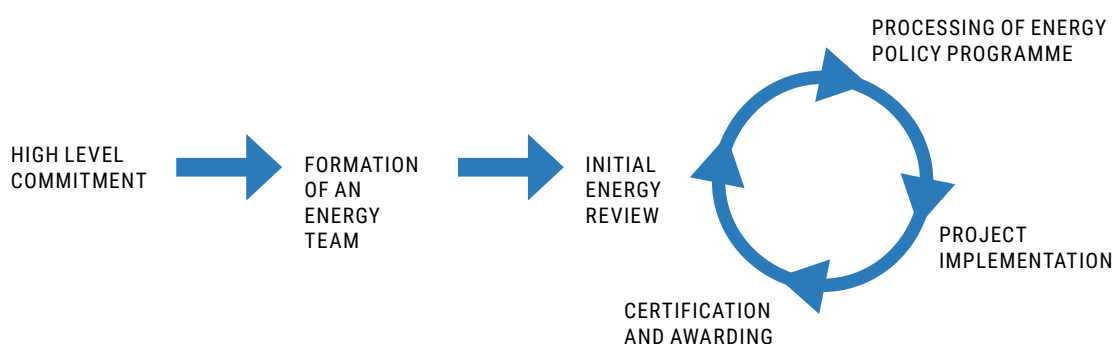
The Association European Energy Award (AISBL) coordinates and harmonises the national developments of the eea, while the European Energy Award Office is mainly responsible for the daily management and administration of the AISBL, and for the coordination and communication among the members. The 8 national eea organisations lead the eea process at the national level. Once the energy team is formed within local authorities, the eea organisation (at the European or national level) provides an accredited eea advisor for technical support to the municipality in the identification of its strengths and weaknesses and throughout the entire planning eea process. The national offices are usually partly financed by contributions from the local authorities, plus funding from regional and/or national level. As for the international Association's activities, they are funded by financial contributions of its member countries, depending on the country's size, participating local authorities, etc.

Recently, the European project IMPLEMENT (funded by Horizon 2020 1.4 million euros) introduced the eea system in Belgium, Croatia, Greece and Poland. The project aims at setting up the necessary structures to carry out the eea programme in municipalities in the new targeted regions.

The eea system is recognized as a tool facilitating the formulation and implementation of a climate and energy plan. eea has therefore signed a [Memorandum of Understanding](#) with the Covenant of Mayors (CoM) in Europe to maximise their synergies and make procedures easier for local governments committed to both initiatives. The EU project "CoME EASY" synchronises eea certification instruments with other EU initiatives like CoM.

FIGURE 20

6 STEPS TO BE FULFIL FOR A CITY TO GET AWARDED - Source: eea website



The monitoring-evaluation, and the audit is done by the independent advisor who looks precisely at the implementation of a [standardised catalogue](#) of 79 climate and energy measures (or frame of reference), all weighted by points, and grouped into six municipal areas of activity. Several tools are at the disposal of the local governments to implement their policies:

- The Catalogue of 79 climate and energy measures,
- A system of 79 qualitative indicators enabling a benchmark,
- The European Energy Award Management Tool (EMT) for quantitative for CO₂ emissions and energy consumption, a tools offered by national EEA programmes.

A participating city commit to a continuous improvement process including 6 steps (fig 21) ensuring the increase of their energy efficiency, use of renewable energies and sustainable mobility. **Once a city completes step 5 called "project implementation", it is either awarded "European Energy Award" if it implemented 50% of the catalogue, or "European Energy Award Gold" if it implemented 75% of the catalogue.**

2019 Achievements

Participating cities mainly come from 8 countries that sometimes have their own national programmes of the eea system (table 6). In addition, around 10 to 20 cities from 6 pilot countries Belgium, Croatia, Greece, Poland, Romania, Serbia, Ukraine participate.

TABLE 6

NATIONAL EEA PROGRAMMES' MAIN FIGURES

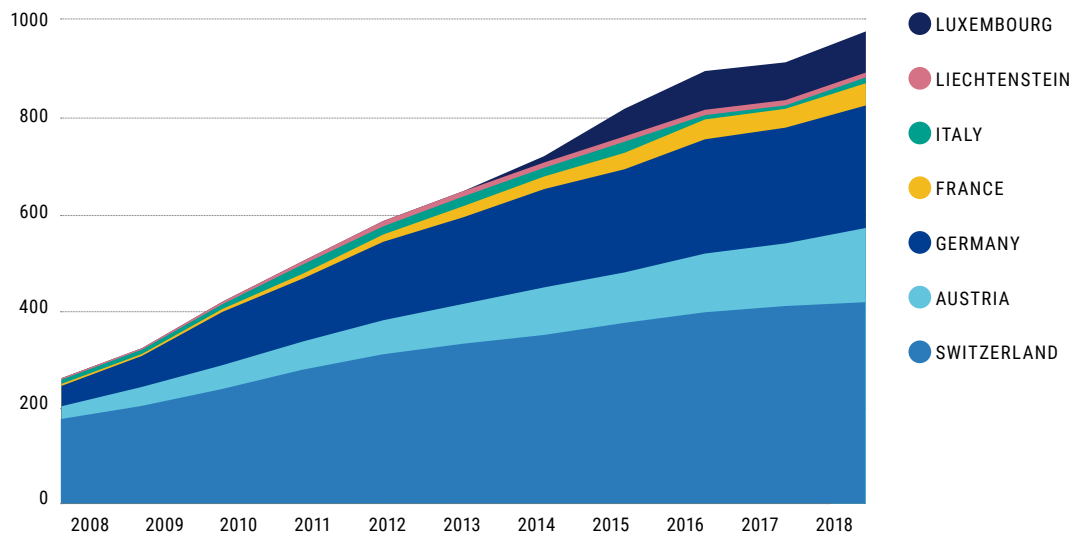
Country	Name of the national programmes (organisation)	Number of participating cities	Certified Cities (GOLD)	Represented population
Austria	Programm für energieeffiziente gemeinden (e5 Österreich)	228	154 (24)	1.67 million
France	Cit'energie (ADEME)	167	47 (2)	20 million
Germany	European Energy Award® (Bundesgeschäftsstelle des)	304	253 (47)	25.2 million
Italy	ComuneClima (SPES Consulting Srl & Agency for Energy South Tyrol – CasaClima)	33	12 (2)	776,300
Liechtenstein	Energiestadt (Amt für Volkswirtschaft)	11	11 (2)	36,868
Luxembourg	PacteClimat (myenergy Luxembourg)	102	85 (8)	590,667
Monaco	European Energy Award (Principality of Monaco)	1	1	38,300
Switzerland	Cité de l'énergie (Trägerverein Energiestadt)	642	417 (46)	5.9 million

At the beginning of 2018, the initiative had:

- 1,504 municipalities participating, involving a total of 48 million people;
- 981 of 1,596 participating municipalities have been awarded the European Energy Award, from around 280 cities in 2007 (fig. 22);
- out of which 131 with the European Energy Award Gold.

FIGURE 21

NUMBER OF CITIES AWARDED BY COUNTRIES 2008-2018 - Source: eea fact sheet



Most of the awarded cities are from Switzerland and Germany, after which come Austria, Luxembourg and France. In France, [Besancon](#) and [Dunkerque](#) are certified GOLD with respectively 78.1%, and 81.3% of implementation. **The two cities mentioned as an incentive to complete the eea system, the capacity offered to evaluate all cities' climate policies with a common framework so that the municipality is able to gauge the level of its transition.**

BOX 14**ADEME IN FRANCE INTRODUCES A LABEL FOR LOCAL CIRCULAR ECONOMY POLICIES**

This label, strongly inspired by the eea energy label and its French version Cit'ergie, results from a partnership over more than 2 years, with representatives from the French Ministry for the Ecological and Solidary Transition, a panel of local authorities (including the Urban Community of Dunkirk from the start of the project), professionals from the waste sector, and associations. This programme, consistently striving for improvement, aims to provide practical assistance to all communities having responsibility over waste management:

It helps assessing policies in relation to the local context and define a strategy for action;

It monitors and evaluates the circular economy's overall performances.

The first cities wishing to engage in such a recognition process could do so as early as 2020.

Source: [ADEME](#), 2019

GLOSSARY OF LOCAL GOVERNMENT NETWORKS, INITIATIVES AND PLATFORMS

CLIMATE ALLIANCE OF EUROPEAN CITIES WITH INDIGENOUS RAINFOREST PEOPLES

International association founded in 1990 with a secretariat in Brussels. The association brings together different levels of governance (local, national, European, international) on projects related to the reduction of greenhouse gas (GHG) emissions, biodiversity, the preservation of tropical forests and awareness of the public on these issues. More than 1,700 cities and local governments are members around the world.

C40 (CLIMATE LEADERSHIP GROUP)

The C40 is a global network of major cities created in 2005, at the initiative of the Mayor of London along with 18 megacities to implement climate actions and to reduce GHGs. Today it brings together 96 of the world's largest cities, representing more than 650 million people and a quarter of the world's economy. Created and run by the cities, the C40 facilitate dialogue amongst city officials and focuses on the fight against climate change, the implementation of urban programs to promote low-carbon and resilient development of cities, and the economic and social co-benefits.

UNITED CITIES AND LOCAL GOVERNMENTS (UCLG)

Founded in 2004, it is the world's leading organization of twin cities and towns. It ensures the representation of local authorities to international institutions to defend their values and their role in the major issues of global governance such as climate change. As such, UCLG was heavily involved in drafting the Mexico Pact. The members of this association (cities or local government associations) are present in 140 UN Member States and represent nearly half of the world's population.

CDP

An international non-profit organization, founded in 2004, which provides a global reporting platform for businesses, cities and regions to measure, disclose, manage and share environmental information, and facilitate decision-making by policy-makers and the network of CDP investors representing more than 1,000 billion assets. More than 500 cities report their emissions and climate actions on the CDP-Cities platform. Cities and regions data are available on their open data portal.

THE CLIMATE GROUP

A non-governmental organization created in 2004 whose activities focus on the animation of networks of large companies and local governments around the energy transition, the diffusion of new low-carbon technologies and renewable energies. It is the secretariat of the Under2 Coalition. In addition, since 2009 the Climate Group organizes the Climate Week in New York City, in parallel with the United Nations General Assembly.

CITIES CLIMATE FINANCE LEADERSHIP ALLIANCE (CCFLA)

Alliance launched in 2014 at the UN Secretary-General's Climate Summit, composed of more than 40 public and private organizations and investors committed to accelerate and catalyse financing in low-carbon and resilient infrastructure in urban areas. Since 2016, the R20 hosts the Alliance Secretariat, with the FMDV, UNEP and UNDP.

THE COUNCIL OF EUROPEAN MUNICIPALITIES AND REGIONS (CEMR)

CEMR was founded in Geneva in 1951 by a group of European mayors, before opening its ranks to the regions. It gathers today more than 60 national associations of cities and regions from 41 countries, representing approximately 130,000 cities and regions. CEMR works to promote a united Europe based on local and regional self-government and democracy, by supporting the Council of Europe's European Charter of Local Self-Government, by strengthening the contribution of local and regional authorities, by influencing the legislation and policies of the European Union, by promoting the exchange of information at local and regional level, and by cooperating with its partners elsewhere in the world. CEMR promotes twinning, which is a network of tens of thousands of local partnerships in Europe and coordinated by PLATFORMA, the coalition of local and regional actors for development and decentralized cooperation at the global level. CEMR is also the European section of the world association United Cities and Local Governments (UCLG).

EUROPEAN ENERGY AWARD (EEA)

Launched in 1988 is a management and award system for municipalities and regions. It supports local authorities in establishing action plans and implementing energy and climate policy measures through the rational use of energy and increased use of renewable energies. The Association European Energy Award (AISBL) coordinates and harmonises the national developments of the eea, while the 8 national eea organisations lead the eea process at the national level.

ENERGYCITIES

European Association of Cities in Energy Transition, created in 1990. It represents 1,000 cities in 30 countries. The association seeks to strengthen the skills of communities in the field of sustainable energy, to represent their interests in the European Union, and to act as a platform for exchange of experiences for the implementation of projects. In addition, this network is one of the founding partners of the Covenant of Mayors for Climate and Energy launched in 2008.

EUROCITIES

Network founded in 1986 by the mayors of 6 major European cities, now gathering more than 140 cities in 34 countries. The association is open to cities of 250,000 or more inhabitants. Its action is based on three pillars: building networks between cities around different themes, representing the interests of cities in the European institutions and promoting the action of cities at international events. The climate and the integration of the environment are among its priorities. In addition, this network is also one of the founding partners of the Covenant of Mayors for Climate and Energy, launched in 2008.

FEDARENE (EUROPEAN FEDERATION OF AGENCIES AND REGIONS FOR ENERGY AND THE ENVIRONMENT) :

Federation created on June 8, 1990 by 6 regional authorities: Rhône-Alpes, Provence-Alpes-Cote-d'Azur, Wallonia, País Vasco, Aquitaine and Nord-Pas-de-Calais. It seeks to promote the exchange of experiences and the development of transnational projects by providing a forum for discussion, for its members and all stakeholders involved in the energy transition. Successive enlargements of the European Union have extended the sphere of influence of FEDARENE. Today, more than 70 organizations from 20 European countries form the FEDARENE cooperation network. In addition, this network is also one of the founding partners of the Covenant of Mayors for Climate and Energy, launched in 2008.

GLOBAL FUND FOR CITIES DEVELOPMENT (FMDV):

International alliance of local and regional governments that enables emerging and developing local governments to access climate finance. The FMDV supports sustainable development and climate projects by providing its technical expertise and financial engineering and acting as a hub of knowledge and recognized facilitator. FMDV has mobilized or collaborated with more than 1,300 cities and regions from more than 110 countries, 250 private companies and most of the technical and financial partners in local development.

ICLEI - LOCAL GOVERNMENTS FOR SUSTAINABILITY

Organization founded in 1990 under the patronage of UNEP, 2 years before the Rio Earth Summit, and in charge of setting up, supporting and coordinating sustainable development projects at the local level around the world, thus improving the global ecological situation, in particular in urban areas. It now includes more than 1,500 communities of all levels of population and governance (cities, towns and regions) in 124 countries. It is currently the main organization of local governments dedicated to sustainable development in the world. It was under its auspices that the Montreal Declaration on Climate Change and the Mexico City Pact was written. It is one of the member organizations of the consortium of the European Covenant of Mayors for Climate and Energy.

REGIONS4

International network created in 2002 on the occasion of the Johannesburg Earth Summit, made up of regional governments and regional and local government associations committed to promoting sustainable development, biodiversity and the fight against climate change. Today it gathers 50 federated states and regional governments from 30 countries and 7 associations of states and regions. The network is accredited to UNEP, to the UNFCCC and to the Convention on Biological Diversity, and it organized the Saint-Malo Summit of Regions on climate change issues. It is the secretariat of the RegionAdapt initiative.

R20 (REGIONS OF CLIMATE ACTION)

Organization created in 2010 by Arnold Schwarzenegger then governor of the State of California, and other world leaders, in cooperation with the UN. The R20 is a public-private partnership, gathering local governments, private companies, financial institutions, academic institutions, government organizations, intergovernmental organizations and UN agencies to develop and implement carbon-neutral, sustainable regional projects, measurable and scaled up on a large scale. It has more than 50 members regions and more than 130 partners.

METHODOLOGY OF THE TERRITORY EMISSIONS INVENTORIES

The territory approach can be differentiated from the organisation approach which studies emissions from the activities of the local authority itself (city heritage/jurisdiction). A greenhouse-gas overview or inventory at territory level studies all flows that drive activity in a geographical or administrative territory, and quantifies the greenhouse gases emitted by these flows.

Scopes

SCOPE 1

Direct emissions produced by fixed platforms or mobile units on the administrative or geographical territory. These are territory emissions linked to individual and collective habitats, travel by inhabitants (work, school, leisure), waste treated on the territory, industry and agricultural activity.

SCOPE 2

Indirect emissions linked to the production of electricity and heating and cooling networks, generated on or outside the territory, but whose consumption takes place within it.

SCOPE 3

All other indirect emissions which take place outside the territory but which are generated by activities of actors in the territories concerned. They are caused, for example, by the production and transport of consumer goods, (air) travel by residents outside the territory, waste treated outside the territory, etc.

3 main approaches for calculating the emissions of a territory

The emissions inventory generally uses the same principles as those for national inventories in line with UNFCCC requirements. The global method is relevant at the level of the national territory and is useful for minimising double counting between countries, and it alone provides a complete overview of the activities of the local territory, by accounting for scope 2 emissions linked to the generation of electricity, steam or heat beyond its boundaries (which is frequently the case with cities), and more generally scope 3 emissions linked to the energy consumed to supply goods and services necessary to the territory's activities.

Global methods can establish diagnoses (inventories) followed by action plans, when the inventory method allows territory emissions to be aggregated, because scope 2 and 3 emissions are frequently scope 1 emissions from other territories and their aggregation could lead to double counting.

The consumption approach offers a method based on the consumption of goods and services by the actors of the territory, its inhabitants, companies and the community's own services. It can be used to identify more specifically other means of action that can be used to reduce its indirect emissions.

FIGURE 1

SOURCES AND BOUNDARIES OF CITY GHG EMISSIONS

Source: "Consumption-based GHG Emissions of C40 Cities", C40, 2018)

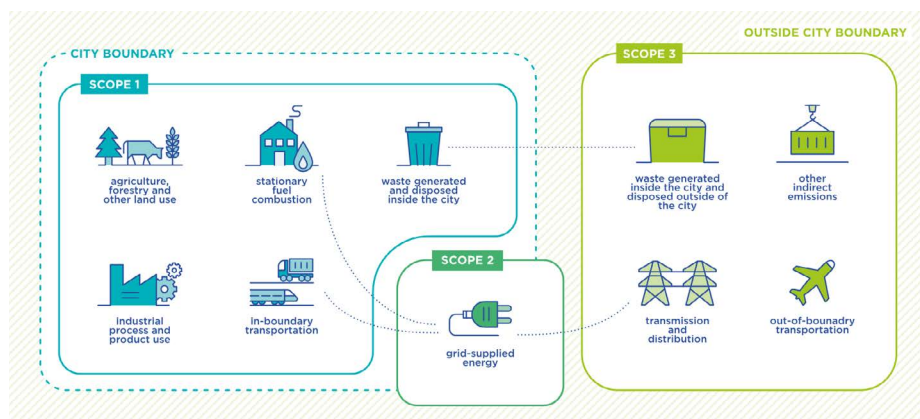


TABLE 1

CHARACTERISTICS OF THE 3 METHODS OF CALCULATING TERRITORY EMISSIONS

Source: Association Bilan Carbone website

Approach	Territorial method	Global method	Consumption-based method
Scope	This calculation of GHG emissions emitted directly on the territory by all actors by activity sector (Scope 1) does not take account of indirect emissions caused by meeting the needs of territories, other than indirect emissions linked to the consumption of energy originating in a production unit on its territory (Scope 2). Scopes 1 and 2	Emission accounting taking account of all GHG emissions, whether direct or indirect, in other words, whether they are emitted by or for the territory. This is a more complex method because it requires a form of data collection that might prove difficult given the dispersed nature of information and a lack of statistical data at community level. A large degree of uncertainty is involved in accounting for indirect emissions. Finally, the use of scope 3, whose accounting methods are specific to each tool, renders comparisons impossible. Variable scopes 1, 2 and 3	Accounting for all goods and services required by the territory (from internal production and imports) and therefore all sectors required for the final consumption by the inhabitants of the territory (sectors present on the territory or otherwise). This approach essentially takes account of the issue of consumption-based emissions as this is an emission source. As emissions are related to the end consumer, actions will naturally focus more on citizens and consumption-based behaviours and production and service companies.
Advantages	More precise method Reductions target based on this method Robust No double counting	Comprehensive coverage of emissions Raises all problems	Easy to interpret Communications oriented towards the citizen
Disadvantages	It has a degree of bias in measuring emission reductions (e.g. outsourcing, electricity, etc.) Excludes international maritime and air transport	Not standardised Complex to interpret Double counting Integrated approach with other territories: enables identification of the degree to which the activity of a different territory can impact its emissions count and vice versa.	Difficult to calculate Calculations cannot be standardised
Uses	International standard Basis for all other methods Permits aggregation to higher levels	Design of a territorial action plan (PCET, PCTI etc.)	Citizen mobilisation
Existing tools	National inventory similar to UNFCCC or equivalent Basemis	Bilan Carbone® Territory Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC) BEI/MEI US Community Protocol	PAS 2070

Existing methods for carbon accounting

INTERNATIONAL ISO STANDARDS

All existing methods must comply with ISO (International Organisation for Standardisation) standard 14064 on climate change, and, more specifically, ISO 14064-1:2006 which specifies principles and requirements for the design, development, management, and reporting and the verification of the GHG inventory, which must comply with the following key principles: relevance, completeness, consistency, accuracy and transparency. More information on [ISO website](#).

METHODS DERIVED FROM IPCC GUIDELINES

The vast majority of territories apply the regulatory methods produced by national local authorities, or methods derived from IPCC guidelines. These methods, applied locally, generally classify the activities of the territory as follows ([ICLEI 2014](#)): Stationary energy, Mobile energy, Waste, Industrial Processes and Product Use (IPPU).

ICLEI has noted, in addition to difficulties in calculating each of these emissions sectors, several limitations at the local level: Overestimates and double counting of emissions, or, on the contrary, underestimates of sectors over which local government has little control (agricultural activities, infrastructure belonging to a higher administrative level). Access to data limited by poor disaggregation of national data for geography. Any emissions related to the consumption of imported goods are direct emissions for other local governments, and this makes comparisons impossible.

A lack of consistency and numerous inaccuracies have led several organisations to put forward global methods designed specifically for territories.

GLOBAL PROTOCOL FOR COMMUNITY-SCALE GREENHOUSE

GAS EMISSIONS INVENTORIES (GPC) (BY ICLEI, C40 AND WRI)

Launched in 2014 by the World Resources Institute (WRI), ICLEI and the C40 to offer guidelines to a range of very different local authorities for calculating their own emissions. This is a global method adapted from the GHG Protocol created by the WRI and the World Business Council for Sustainable Development (WBCSD) in 1998 for businesses, replacing the International Local Government GHG Emissions Analysis Protocol (IEAP) developed by ICLEI, and the International Standard for Determining GHG Emissions for Cities of the UNEP, UN-Habitat and the World Bank. It was designed to facilitate the planning of local government climate policies including tracking performance and selected goals, and to compare and aggregate inventories at regional or national levels and better gauge the importance of regions and cities.

Further information: [ICLEI presentation of the GPC and GHG Protocol website](#)

BILAN CARBONE® TERRITORY

Bilan Carbone® is a global method created by the Agency for the Environment and Energy Management (ADEME) in 2004 and backed by the Association Bilan Carbone (ABC) since 2011. Version 8 of Bilan Carbone® launched in 2017 was developed to align with post-COP21 best practices and offers different tools suitable for organisations and territories. It can be used to carry out particularly exhaustive emissions accounting with, as its main objective, emissions reduction. The use and methodology of the Bilan Carbone methodology and tools is supported by training delivered by the [Institut de Formation Carbone](#) (IFC) (Carbon Training Institute) or by an expert trained in its use.

For this purpose, it offers outlines for activity data collection and a dashboard for drawing up an emissions-reduction action plan. These tools can be exported in other formats such as those used by GPC or CDP to meet different existing standards. The method suggests that the approach should be renewed each year with close monitoring of the action plan.

Further information: [Association Bilan Carbone website & Bilan GES website](#)

OTHER METHODS

Baseline Emissions Inventory (BEI) / Monitoring Emissions Inventory (MEI): A [global](#) method of calculating emissions included in the Covenant of Mayors MRV mechanisms and the MyCovenant platform available in 11 languages. These inventories are validated by the European Joint Research Centre. These inventories cover CO₂ emissions, and optionally methane (CH₄) and nitrous oxide (NH₂) emissions, related to the final energy consumption of municipal, tertiary and residential buildings and transportation. Other sectors such as industry may be included in the inventory if they are subject to actions under the Sustainable Energy and Climate Action Plan (SECAP). Similarly, emissions related to local energy generation are counted as indirect emissions, encouraging local governments to reduce the emissions of production units via local renewable energies, etc. Finally, this method allows local governments either to use standard IPCC emissions factors, or to use life-cycle emission factors (accounting for upstream and downstream emissions).

Further information: [Joint Research Centre website](#)

US Community Protocol: [Global](#) method devised by ICLEI US for use by local governments in the United States. It is also a global method designed for measuring emissions, formulating emissions-reduction goals and producing an action plan. This method does not adopt the scopes framework described above as it is not suitable for calculating a territory's emissions. Instead, this protocol requires the reporting of emissions for a minimum of five activities: (1) use of electricity by the community; (2) use of fuel in buildings (gas etc.); (3) use of fuel in passenger and freight transportation; (4) use of energy in drinking water stations and wastewater treatment and distribution; (5) generation of solid waste by the community.

Further information: [Air Pays de la Loire website](#)

BASEMIS®: [Territorial](#) method developed by the cities of Nantes and Strasbourg, in collaboration with air-quality monitoring agencies (agences de suivi de la qualité de l'air - ASQA) in France. It has the advantage of offering an integrated air-climate and energy approach, with a detailed inventory of atmospheric pollutants. It is a territorial or "land registry" accounting method as it counts emissions in the place in which they are emitted, on a defined territory. It inventories all sectors emitting stationary (industrial and agricultural establishments, residential and tertiary sectors) and mobile (road, air, rail transportation, etc.) emissions using the following formula: the quantity of pollutants discharged into the atmosphere over a time period, T, multiplied by a particular quantity of activity (tonnes produced, kms travelled, kWh hours consumed, number of persons, etc.). For energy-based emissions, activity quantity is energy consumption.

Further information: [Pays de la Loire regional website](#)

PAS 2070 : [Double](#) method developed by the British Standard Institute in collaboration with universities, research centres and local government networks (ICLEI, C40), which can also take account of activities outside the territory, enable emission comparisons between territories and identify means to reduce them within the urban value chain. PAS 2070 offers both a global "Direct plus supply chain" (DPSC) method based on the Global Protocol for Community-Scale Greenhouse Gas Emissions (GPC), and a consumption-based method which calculates direct emissions and those related to the life cycles of goods and services consumed by a city's actors (but not those intended for export).

Further information: [British Standard Institute website](#)

SECTION II

Territorial results



WASTE



AWARENESS



DECENTRALIZED
COOPERATION



URBAN PLANNING



ENERGY



LAND USES



BUILDING



FOREST



TRANSITION
OF THE ECONOMY



TRANSPORT



FOOD



ADAPTATION

13 CITIES ACROSS THE WORLD





ANDALUSIA

POPULATION: 8,384 MILLION (2018)

GHG TARGET: -20% BY 2020 COMPARED TO 1990; -30% BY 2030 COMPARED TO 2005

SCOPE 3 AVAILABLE

The national leader for renewables

Climate policy governance and integration

Andalusia is the first autonomous Spanish community to have adopted, since 2002, an independent strategy to fight climate change. Based on the Andalusian Climate Plan 2007-2012 (PAAC). This founding plan is, still today, the cornerstone of Andalusia's climate policies, and has become the climate component of the Andalusian Sustainable Development Strategy 2030, that raises the reduction target in 2020 and 2030. More recently, the Andalusian Parliament adopted [Law 8/2018](#) (in force since January 2019), that creates an Interdepartmental Climate Change Commission, a transversal commission in charge of planning climate measures, as well as that of the Andalusian Office for Climate Change that will be the administrative unit for managing mitigation, adaptation and communication policies.

At the local level, the Junta Andalusia Environment Council as well as the Andalusia Federation of Municipalities and Provinces have been organising the [Ciudad 21](#) programme which in 2011 became [Ciudad Sostenible](#). It groups together 291 member municipalities – where 90% of the Andalusian population lives – which are supported in the implementation of over 600 urban development projects. Andalusia may be the most emitting region in Spain, with 14% of GHG emissions, but it also accounts for nearly 18% of the population ([Lavanguardia](#), 2018).

Climate policy tracking

According to the [Agriculture, livestock, fisheries and sustainable development Council](#) of Andalusia, the total of GHG emissions in the region has decreased by 21.7% between 2005 and 2017. The decrease observed since 2005 does not compensate the emissions increase that took place in the 1990s, since during the 1990-2015 period, emissions grew by 40%. To calculate its emissions, the region differentiates its so-called 'non-diffuse' emissions (RCDE), subject to the European Emissions Trading System (EU ETS) (electricity production and cement industry, steel, etc.), from diffuse emissions related to energy use (transport, agriculture, waste).

In 2017, the latter were slightly higher than the former, with 51.7% of total emissions. Transport accounts

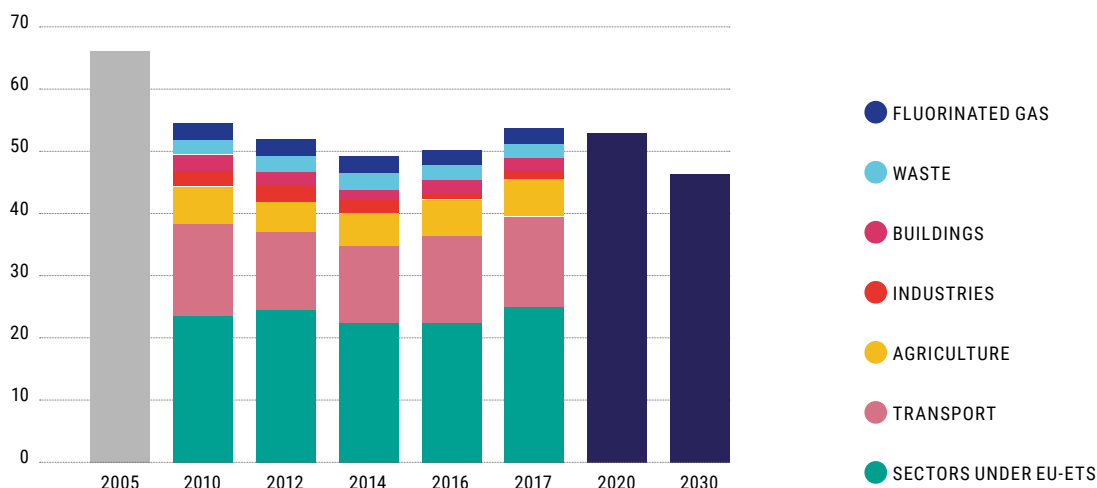
for 53.3% of these diffuse emissions (27.5% of the total) and has been increasing since 2014. Emissions from agriculture in 2017 are stable at 11% of the total, and waste decreased at 4.7% of the total and a decrease of 15.5% between 2010 and 2017. Nevertheless, the significant drop in total emissions is due to the 22.7% decrease in industry, production and electricity cogeneration-related emissions between 2005 and 2017 (from 32 MtCO₂ to 25 MtCO₂).

A national leader in renewable energy production

In 2017, [renewable energy represented 38.8% of the region's total energy production](#). In 2019, 54.43% of renewable energy comes from wind power, 31% from solar, photovoltaic and thermodynamic sources combined. In 2011, the world's first thermodynamic power plant was installed near Seville. Andalusia is now the main producer in the country, with 22 power plants and 22.7% of national production, making Spain the world's leading producer. Andalusia also leads in electricity production originating from biomass, mainly from olive and eucalyptus crops. In 2012, the company known as Ence built, with the support of community subsidies, [the largest biomass factory in Spain](#), with a capacity of 50 MW, supplied by its own cellulose production. It provides 400,000 people with green energy.

- The 2020 Programme for Development of Renewable Energy Initiatives "[Andalucía es más](#)", aligned with the [2020 Energy Strategy of Andalusia](#) has 76 measures in 3 aspects for reducing energy consumption in SMEs, housing and public administrations.
- The section on [sustainable building](#) (€180 M) puts in place insulation work as well as the installation of the renewable energy production system for self-consumption. 1,384 solar, photovoltaic or thermal installations for self-consumption have been installed, of which 72% have been installed in private homes ([Interempresas](#), 2019).
- The [section on SMEs](#) (€36.7 M) for financing 25 to 50% of energy projects such as the improvement of interior and exterior lighting, and thermal insulation of housing. Emphasis is also placed on the development of cleaner transport solutions and route optimisation for SMEs with a fleet of at least 5 vehicles.

ANDALUSIA - GHG EMISSIONS (IN MTCO₂E)



- Finally, the [section on smart grids](#) plans support for the installation of smart grids in municipalities, the installation of charging stations for electric vehicles, or the renewal of the public transport fleet. For municipalities with a population of less than 20,000, project funding can reach 80%.

Economy – The voluntary Carbon Offsetting Scheme “SACE” in the process of becoming mandatory

The [Andalusian carbon offsetting scheme](#) (SACE) was implemented by the Environmental Council. It focuses on the voluntary involvement of businesses auto-evaluating their emissions via an IT tool – available to all businesses. This tool categorises 3 emission scopes: direct emissions, those related to energy consumption, and those indirect upstream or downstream of its activity, the transport of raw materials or finished products. Based on the results of the auto-evaluation, the company, with the administration, defines a plan to stick to reducing first and second range emissions.

In the event of failure to implement the plan, companies must set up a project to offset all or part of the unreduced emissions, often forestry or reforestation projects. Since 2009, 98 companies have joined this programme, but no data has been provided yet to assess the effectiveness of this measure.

ADAPTATION

FINANCING RESEARCH AND NGOS

[The Andalusian Plan for Adaptation to Climate Change](#), approved in 2010, the second pillar of the PAAC, has been shaped into 4 sub-programmes implemented by various Councils of the Autonomous Community.

The Agriculture, Fishing and Rural Development Council is one of the most active of its kind financing up to 1,051 million euros-worth of projects, including 13 research projects on adaptation of agriculture to climate change in the framework on its 2014-2020 [Rural Development Plan](#). Along with projects on the improvement of water use, research projects mainly focus on the adaptation of main crops in the region with subjects such as: biodiversity with vineyards, [the effect of climate change on the olive tree](#) or the management of almond tree crops.

The Council issued a decree in August 2019 to increase subsidies for projects to adapt forest ecosystems in an area that includes nearly 50% of forest area. For the first time, two organisations ([Arboretum and Produnas](#)), leading adaptation projects, received public funds from the municipality of Marbella. [Arboretum](#) for example, works on the development of urban gardens in Marbella to conserve 131 species of plants, said to be indigenous to the region.



SANTIAGO DE CALI

POPULATION: 2,396,829

SCOPE: 1, 2, 3 AVAILABLE

Emerging actions, solid foundations

Climate policy governance and integration

Since 1994, the municipality of Cali has an [Environmental Management System](#): a founding text framing all of the city's environmental policies. The [Administrative Department of Environmental Management](#) (DAGMA), an entity that depends on the municipality, is in charge of developing and applying the environmental laws and plans throughout the 22 municipalities of Cali. At regional level, the [Regional Autonomous Society of the Cauca Valley](#) (CVC), launched in 1954, and dependent on the Colombian government but autonomous in its management, is in charge of managing all natural resources.

In 2015, the DAGMA, the CVC and the [International Centre for Tropical Agriculture](#) (CIAT), defined a Municipal Strategy for Low Carbon Development, including the 73 grouped actions in 5 Sectoral Action Plans¹ (PAS), which must be implemented between 2020 and 2040. Within each PAS, a weighed evaluation of the different measures was carried out in order to prioritise their enforcement. The plan does not define an emission reduction target.

Climate policy tracking

For the first time, in 2015, Cali, with the Regional Autonomous Society of the Cauca Valley [and the International Centre for Tropical Agriculture](#), published [a complete inventory of the city's greenhouse gas \(GHG\) emissions](#) as well as other polluting gases. Cali's inhabitants emit 2 tonnes of CO₂ per year and per person, representing less than the national average which is 3.7 and the Latin-American average of 2.1 (DAGMA).

Between 2010 and 2015, GHG emissions fell by 9.13%, going from 4.2 to 3.8 million tonnes (Mt) of CO₂eq. The most significant drop was in the industry sector with -58.1% of GHGs in 5 years. The sectors that emit the least are the residential and industry sectors with 11% and 10% of overall emissions in 2015. Transport emits the most with 51% of overall emissions in 2015. Cars are the biggest emitters in this sector (50%) followed by lorries, juggernaut and buses combined (32%).

Another important sector is waste, responsible for 25% of GHG emissions in 2010 and 22% in 2015.

Economy Transition – A local compensation system to accompany businesses

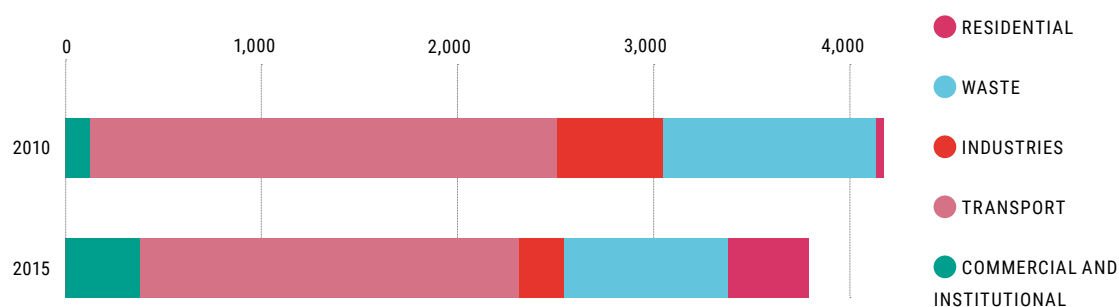
Since 2014, the DAGMA and CVC launched the ["Sello Cali Carbono Neutro Organizacional"](#) (SCCO) programme, a voluntary programme for reducing the carbon footprint of businesses and administrations located in Cali. Since 2017, the municipality supported 47 businesses with setting an emission reduction target, and the necessary measures to achieve it (thermic insulation, improvement in their heating system, etc). Businesses that do not achieve their objectives are encouraged to offset emissions via multiple accredited compensation schemes. The ["BanCO₂"](#) was established in 2017 by the [Regional Society of the Cauca Valley](#), and is a banking platform that allows companies and individuals to offset their carbon footprint. The money collected is paid monthly to farmers and peasants that work on preserving forests on their land. BanCO₂, through its platform, also helps individuals calculate their carbon footprint and make donations for offset measures. At the start of the project, 18 families living in the Dagua River basin, about 50km from Cali, received a piece of these donations to help them to preserve their lands.

Transport – Defining objectives and solutions per travel purpose

In November 2019, the Municipality of Cali published [5 sector-based mobility plans](#) aimed at different travel purposes, for: local officials, students, employees of private companies, medical services and urban logistics. The objectives common to each of the plans are: -5% of public transport use, and lastly the organisation of working sessions with them to shape the sector-based mobility strategies. According to the 2015 household-journey survey, 32.6% of daily commutes were on foot in the city of Cali, 4.5% by bicycle, 30% with private vehicles and 21.4% by public transport.

¹ Housing and local development, transport, waste management, water and sanitation, agriculture and industry, energy, mines and oil

CALI - GHG EMISSIONS (KTCO₂)



In parallel, DAGMA, in partnership with the traffic secretariat and [METROCalí](#), has been leading a policy to combat polluting vehicles since 2015, and has partially replaced them with 760 vehicles integrating the [MIO](#) High-level Bus Service Network.

As part of the Cali's Low-carbon development Strategy, the [Sector-based Action plan \(PAS\)](#) on transport (2018) provides for the replacement of 30% of the bus fleet by electric buses by 2040. The PAS estimates the CO₂ reduced and the cost according to the traffic forecast (100 000 or 200 000 km/yr) and the type of bus (size and fuel - electric or gas) estimated between 10 and 76 MtCO₂/year by 2040. As of August 2019, 26 electric and 21 gas-powered buses were put on the roads. A total of 266 low-emission buses are also expected to be put into service out of the 920 planned to achieve the 30% target.

Buildings – Changing the public lighting system

During the first half of 2018, the Municipality of Cali began changing public lighting in 48 districts of the city. The idea was to move away from a system operating on sodium bulbs, to an LED system. This change, once implemented across the city, should result in energy savings of up to 40% to 50%, representing an annual saving of \$20,000 million. The modernisation of public lighting is expected to take 2 years in total, to be completed in 2020, and will require replacing 160,000 lights. In 2018, 26,346 light points were changed. The priority areas for the implementation of the new urban lighting were those where safety for motorists, pedestrians and residents alike, was improved. LED technology was also installed on 909 bus shelters.

ADAPTATION

NO PLAN, BUT REFORESTATION PROGRAMMES

[The ecosystem conservation group of the DAGMA launched the Plan Ave Fenix](#) in order to enable reforestation across the hills of Cerro Cristo Rey and Los Cristales. This programme was drafted following bush fires that ravaged over 103 hectares of vegetation in 2018. Between April and May 2019, 3,000 trees were replanted, thanks to the mobilisation of nearly 1,800 volunteers. The Government of la Valle del Cauca also launched a reforestation plan for the region, the [Greener hills programme](#), in collaboration with Cali as the Cerro Cristo Rey and Cerro de la Bandera are concerned. The 12th October 2019, as part of the programme, over 2,000 trees were planted across the three hills.

These reforestation plans are also in line with the [Municipal Development Plan 2016-2019](#), that plans to plant 100,000 trees by the end of December 2019.



CHHATTISGARH

POPULATION: 25,545,198 (2011)

GHG OBJECTIVES: INDIAN NDCS + UNDER2 MOU

Forests to link adaptation and mitigation

Climate policy governance and integration

Chhattisgarh's economy is highly dependent on [climate-sensitive sectors](#) (agriculture, forests, animal husbandry, etc.). The effects of climate change, aggravating over time, already take a toll on these sectors and extreme events all contribute to increasing the sensitivity of farmers and worsening poverty in a state where over half of the population lives [below the poverty line](#), more than twice the country's average.

The state of Chhattisgarh has not set forth quantified commitments, but has repeatedly assured its [contribution to national NDCs](#): by 2030, [India pledges](#) a reduction of emissions intensity of its GDP by 33 to 35% (baseline: 2005), 40% non-fossil fuel based energy, and 2.5 to 3 billion tonnes of CO₂e of additional carbon sinks. Since 2017, Chhattisgarh is also an endorser of the Under2 MoU, and therefore non-bindingly commits to reach [net-zero](#) GHG emissions and/or to limit per capita GHG emissions to 2 metric tonnes by 2050.

India contends that "there can be no 'one-size-fits-all' climate change strategy" (CSAPCC, 2014), which calls for specific sub-national State Action Plans for Climate Change (SAPCCs). The Chhattisgarh SAPCC (CSAPCC) focuses on 8 key sectors: Agriculture & Allied Sectors, Forest & Biodiversity, Water Resources, Urban Development, Transport, Energy, Industries & Mining, Human Health. The CSAPCC also has the [specificity of integrating gender](#).

Energy – Developing and adapting renewables to local context

Despite being [India's most carbonated state economy](#), a shift towards renewables can help Chhattisgarh towards decarbonation, as it is only [at 2.4% of its renewable energy potential](#) (estimated potential: 20,000 MW).

Chhattisgarh's power production to consumption ratio is higher than the average of other states, despite year-on-year increases in demand. However, Chhattisgarh is so densely forested that grid extension is difficult. Unreliable grid electricity becomes a [critical issue](#): 36% of primary health centres report unmet

electrification needs with dramatic consequences on health. The deprivation of adequate electrification acts as an incentive to turn to solar power: as part of its [Solar Energy Policy](#), Chhattisgarh installed 2 kWp off-grid solar PV rooftop systems across 570 PHCs between 2012 and 2016 (CEEW, 2018). In 2016-2017, [159 State Government schools](#) were powered using solar energy.

Through [Solar Cities Master Plans](#), the cities of [Raipur](#) and [Bilaspur aim for](#) a minimum of 10% reduction in the projected demand of conventional energy within 5 years, combining energy efficiency measures and enhancement of renewable energy supply. Chhattisgarh's Government also has to create within 5 years of [2,000 "Suryamitras"](#), skill development programmes for the youth seeking employment in the solar energy sector.

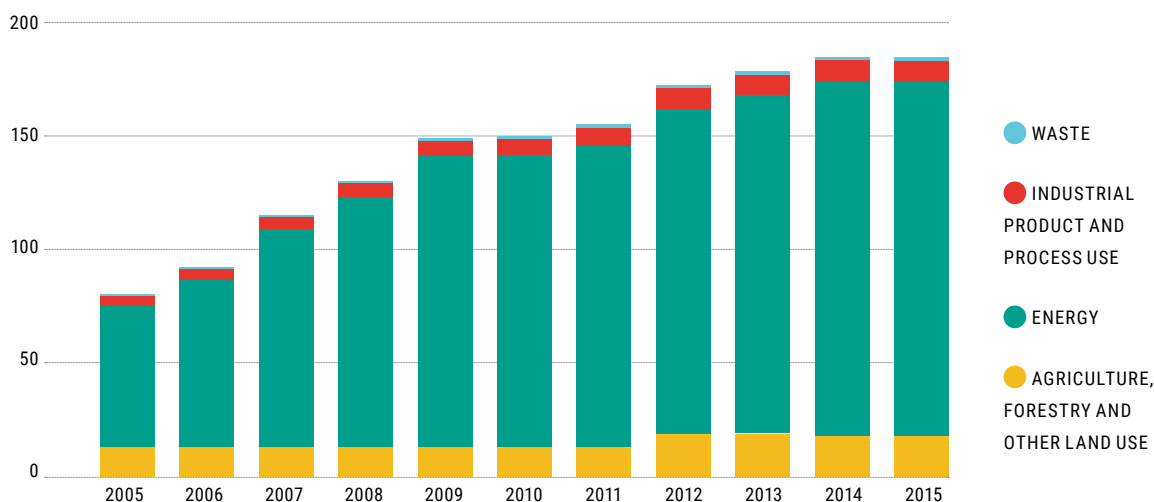
The core of Chhattisgarh's electricity is produced in thermal power plants, which are heavily impacting freshwater resources. The ash and industrial effluents discharged from the plants contaminate water sources, down to the crops: degraded water quality lowers the quality and quantity of rice yield. [To mitigate these impacts](#), Chhattisgarh has mandated power plants to use recycled water, the state is investing in wastewater infrastructure to deliver non-potable water at reduced prices for thermal plant cooling applications, and it decentralizes water treatment for both rural and metropolitan settings.

Land uses – The loss of carbon sinks

Forests covered [41%](#) of Chhattisgarh's surface in 2017, and have acted as the state's most proficient [carbon sink](#): land has continuously ensured greater emissions absorption than generation until 2011, when numerous hectares of forest land were [opened for mining](#). The [livelihoods of forest dwellers](#) depend on food and income from [non-timber forest produce](#) (NTFP, designating forest products that do not require tree logging), which are increasingly threatened by climate change. [Action on Climate Today \(ACT\)](#), a five-year World Bank initiative, is thus helping these vulnerable populations by creating employment opportunities mostly through conservation activities.

CHHATTISGARH'S - GHG EMISSIONS (IN MTCO₂E)

Source: [Economy-wide emissions estimates retrieved from GHG Platform INDIA \(2016\)](#)



Adaptation – Agroforestry to bundle both mitigation and adaptation

The CSAPCC stipulates that “Adaptation’ will be the predominant [...] climate response strategy of Chhattisgarh”, and focuses on conciliating hard and soft adaptation strategies of ‘[natural infrastructure](#)’ to improve resilience, on ensuring synergies with mitigation, and on “[further \[recognizing\] and \[supporting\] women’s role in adaptation](#)”.

Adaptation in Chhattisgarh is [largely forest-based](#). The strategy is two-fold: adaptation for forests (strengthening forests’ capacity to deal with climate change), and forests for adaptation (using forests to help strengthen resilience to climate change and support livelihoods). [Joint Forest Management](#) oversees 55.52% of Chhattisgarh’s forest area: it works on improving water conservation and management, on bamboo regeneration activities, on sustainable NTFP harvesting, on nursery developments and afforestation, on biodiversity, and on [wetland conservation](#).

ACT’s [technical session](#) on climate resilient agriculture in Chhattisgarh highlighted that “agroforestry systems readily bundle both mitigation and adaptation”. One of its [studies](#) on climate-smart agriculture identified local adaptation strategies: adopting shorter-duration, hybrid varieties to deal with altered seasons, planting or mixing high-yielding varieties with local varieties, and turning to more resilient traditional millet varieties. [Resilience enhancement strategies](#) were adopted by the Chhattisgarh Government, such as weather-based crop insurance schemes, and training on climate-smart agriculture. On average, livestock contributes 55% of total land use emissions and rice cultivation 38%, [the](#)

[second largest emitter](#). Agriculture [provides income](#) to approximately 80% of Chhattisgarh’s rural population. 46% of these farmers depend on [rain-fed mono-crop agriculture](#), a practice that increases vulnerability to the effects of climate change by reducing adaptive capacity. Rice - Chhattisgarh is the “rice bowl of India”, with [19,000 native species](#) - and wheat are expected to undergo significant productivity declines. In 2016, Chhattisgarh launched a [solar community irrigation project](#): the State government targeted to install 51,000 solar pumps to irrigate 50,000 ha of land. These pumps have a 155 MW generation capacity and are 95 to 98% subsidised by the State government.

Waste – The innovative way of Ambikapur city to collect waste

While in 2015 [none](#) of the State’s waste was treated, there were [84%](#) of the 601,885 million tonnes of annual solid waste processed in 2018, more than any other Indian State. It is also the first Indian State to have introduced [E-rickshaws](#) to collect waste: these have been extremely successful, and have greatly enhanced Raipur’s waste management performance.

Ambikapur has set up a [garbage café](#), where plastic waste collectors receive free meals in exchange for their service. The plastic is then mixed to asphalt and used to build roads. Ambikapur transformed its former 15-acre landfill into a [Sanitation Awareness Park](#) with trees and ponds. [447 women](#) from self-help groups (SHG) engage in daily door-to-door household waste collection – the SHGs also ensure training programmes in SLRM (solid liquid resource management). A tax is raised for managing operations and for the maintenance of the project: houses, shops, hotels, hostels, and ashrams all contribute proportionately to their activity.



GRENOBLE

ALPES METROPOLE

INHABITANTS: 445,516

2020 TARGET: -35% GHG / 2030 TARGET: -50% GHG

SCOPE 3 AVAILABLE

Metropolis action, the driving force of the transition

Climate policy governance and integration

Grenoble Alpes Metropole, made of 49 municipalities, was the first French municipality to adopt a Climate-Air-Energy Plan (PAEC) in 2005. A steering committee as well as a [scientific council](#) enables elected representatives and other stakeholders to take part in the plan's follow-up and implementation. Tracking the Climate-Air-Energy Plan is optional but in 2004, the Metropolis put in place the [Climate-Air-Energy Plan Observatory](#) in partnership with Air Auvergne-Rhône-Alpes and the Local Energy Agency (Alec¹). It tracks energy consumption and renewable energy production, and GHG emissions. The local data is aggregated at the regional level.

The Local Climate Air and Energy Plan (PCAET) adopted in 2019, provides for an investment amounting to +500 million euros between 2020 and 2030, and positions itself as the backbone of all policies. It was intended to be more inclusive than required by the French legislation, with a 4-months-long [public consultation](#). **It must take into account the National Low-Carbon Strategy (SNBC)**, and in a more restrictive way **must be compatible** with the Regional Planning, Sustainable Development and Equality of Territories Scheme (SRADDET) of the [Auvergne-Rhône Alpes region](#). Lastly, its objectives are designed to make the various operational and sectoral variations consistent, such as the [Local Inter-communal Urban Development Plan \(PLUi\)](#), the [Urban Transport Plan \(PDU\)](#) and the [Energy Master Plan \(SDE\)](#).

Climate policy tracking

The metropolis reduced its GHG emissions by 25% between 2005 and 2016, reaching 1.87 MtCO₂eq/year, as well as its final energy consumption of 20%. The decrease is accounted for by the 27% decrease in consumption of the 20 largest manufacturers (compared to 9% on average in the 20 other sectors), which is largely related to the decline in activity and jobs within them (-28%).

Yet, the [preliminary diagnosis to the PAECT](#) estimates that the programmed measures will not be sufficient to reach the target for cutting GHG levels by half by 2030. Finally, the Metropolis's carbon footprint estimated at 3.67 MtCO₂eq/year shows that indirect emissions related to consumption (scope 3) are as important as the direct emissions covered by the climate plan.

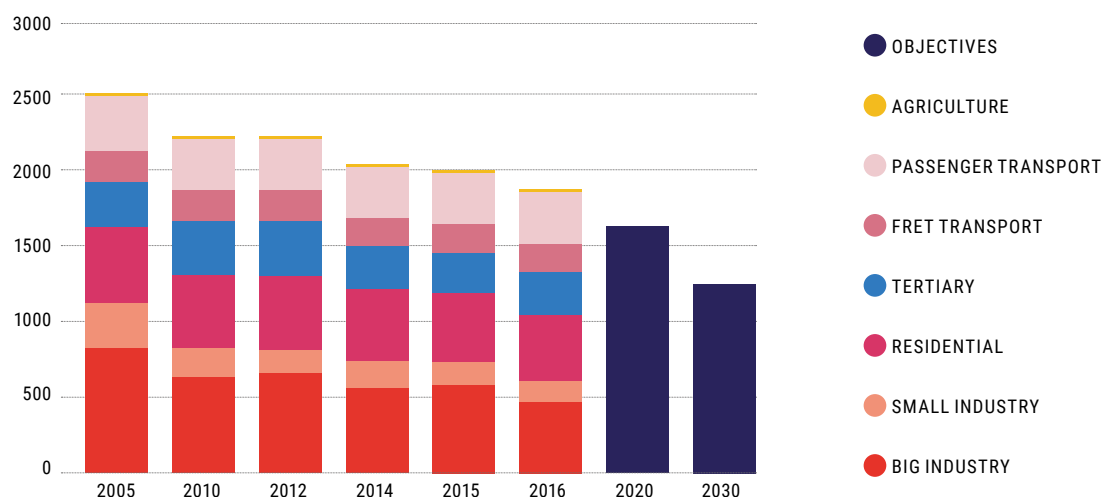
Buildings – A public service dedicated to energy efficiency

Energy efficiency programmes, designed by the Metropole and led by Alec, tackle the first source of GHG emissions (39%) and of final energy consumption (46%) in 2016. This driver is still barely being used since 2005: emissions fell by 12% and 7% for the housing and tertiary sectors, while their energy consumption remained stable and even increased in the tertiary sector. That is why, the metropole is seeking to implement a Public Service for Energy Efficiency (SPEE) within its services, going beyond the buildings' energy performance.

The "[Mur-Mur II \(2016-2020\)](#)" scheme allows the renovation of nearly 1,500 housing units/year providing funding to co-owners or by co-owner according to income (15 to 20,000 euros) for external renovation projects, and a list of [75 certified companies](#). Besides adding to the 4,500 renovated units during the first phase 2012-2016, Mur-Mur partially meets the objectives of the SDE (2,500 housing units per year). A second "Metro Energy" system offers small and medium-sized companies a free energy diagnosis and personalised advice. The estimated 94 billion euros in construction represent a potential of 1,800 jobs in the region. Also, the municipality of Grenoble stands out for its [many flagship projects](#): the "Presqu'Île" neighbourhood benefits from a heat pump system connected to the groundwater enabling buildings to be cooled in the summer. In the "[Flaubert](#)" district, the city is working with social landlords to increase the use of local building materials (wood, straw) expected to account for 25% by 2025.

¹ In line with the European definition, an ALEC is "an independent, autonomous and not-for-profit organisation, created via the initiative of local authorities and of groupings benefitting from local public authorities to provide information, advice and technical assistance to energy consumers."

GHG EMISSIONS OF GRENOBLE METROPOLE 2005-2016 [KTEQCO₂] - Source data: [PAECT - Diagnostic 2019](#)



Energy – Local energy companies driving public action

Renewables in 2016 accounted for 18% of final energy consumption and 24% of electricity (2,000 GWh/year), led by hydroelectricity (40%), wood-energy (30%) and recovery energy (28%). However, since 2013 the light rains led to a decrease in production between 2013 of 30% and solar production is still low and stagnant at around 13 GWh/year.

What makes the Metropolis' case very particular is the presence of the two local energy companies "[Gaz et Electricité de Grenoble](#)" (GEG) and "Compagnie de Chauffage" (CCIAG), two mixed economy companies predominantly owned by local authorities:

CCIAG is the second biggest heat network in France after Paris, supplying 46,000 homes. Since 2018, buildings within 150 meters of the grid must be connected to it. This is justified by the quantity of avoided emissions linked to the use of wood instead of gas, and by savings made by households. The "Biomax" cogeneration project should increase rapidly the share of recovery energies in its mix (65%) with 183 GWh of heat (equivalent to the needs of 15-20,000 homes), and 37 GWh of electricity.

GEG distributes energy in 12 other cities in the agglomeration and represents an important lever of action for local energy policy. Its renewable energies sector has developed hydroelectric, solar and wind production units in order to reach the equivalent of Grenoble's consumption by 2022 (400 GWh/year, compared to 147 currently).

Mobility – A development plan at the basin level

Road transport demand (kilometres travelled) continues to increase since 2005, and actions of the

PDU2030 adopted in 2017 are now in progress to address it:

- The extension of Low-Emissions Zones for Heavy Duty since 2019 to 10 municipalities, with progressive vehicle emission criteria until 2025;
- The restriction of car traffic in several areas where 15,000 people pass by daily
- The "[Chronovélo](#)" 6-million-euro-plan / year for the improvement of infrastructure. Currently 70,000 daily trips are by bike against 1.7 million in total. The only city in Grenoble targets 20% of the modal share by 2020 against 7% in 2016.

Trips within the metropolis remain a crucial challenge accounting for 60% of travelled kilometres and GHG emissions related to road transport ([p16](#), [PDU](#)). The plan provides for a series of actions that take into consideration transport-related precariousness in the connection between peri-urban areas.

ADAPTATION

COLLABORATING WITH NEIGHBOURING AREAS

The adaptation strategy is fully imbedded with resources and territorial management in several sectors.

With the regional nature parks and neighbouring municipalities, the metropolis is planning a territorial food project to relocate the food supply of 800,000 people. Moreover, the territorial agricultural policy provides for enhanced land protection for agricultural land, which represents 15% of its territory. The Metropolis intends to halt artificialisation by imposing disartificialisation criteria for the evaluation of public infrastructure projects ([GM](#), 2019; [PLUi](#), 2018).

Lastly, the Climate Plan Observatory will now be integrated with other local observatories related to biodiversity, health, and well-being indicators.

CITY OF HEIDELBERG

INHABITANTS: 160,000

2050 GHG TARGET: - 95% COMPARED TO 1987

SCOPE: ONLY EMISSIONS FROM BUILDINGS ARE AVAILABLE



Sustainable housing for all

Climate policy governance and integration

After a first climate plan in 1992, the city of Heidelberg adopted in 2014 its "Masterplan 100% Klimaschutz", funded by a programme of the German Federal Ministry for the Environment (BMUB). This programme binds the city to formulate and implement a climate plan to achieve 95% reduction of GHG emissions and 50% reduction of energy consumption by 2050.

For its implementation, Heidelberg has expanded and given a central place to the Heidelberg Climate and Energy Protection Group ("[Heidelberg-Kreis Klimaschutz & Energie](#)"), formed in 2002 and composed of representatives of companies, associations, craftsmen, architects, the university, the hospital, the city, the army etc. Citizen participation was made possible by holding conferences on climate action, and a Youth and Climate Summit every two years, bringing together some 80 participants in total. In 2017, the Masterplan's assessment considered that the control on the city's energy choices (made possible by previous political choices) has been decisive in adopting high-impact solutions and facilitating the support of all stakeholders ([Ifeu 2017](#)).

Climate policy tracking

The 2017 assessment report shows a reduction in stationary CO₂ emissions (corresponding to buildings emissions) of 7% between 1987 and 2015 (fig.), while total final energy consumption increased by 6%, and the population by 12% over the entire period. The per capita intensity has therefore fallen sharply by 18%, from 7.1 to 5.8 tCO₂/hab. Still, these efforts did not allow a total decrease of 20% of GHG emissions in 2015 (compared to 1987) as initially targeted by the city. Transport fuel consumption and emissions data and their evolution are not provided, but were estimated at 350 tCO₂ in 2010 ([Masterplan100%](#), 2014), roughly representing 26% of the emissions that year.

Regarding the implementation process, in 2017 25 measures had already been completed in all the working groups, 50 measures were in progress, and 39 remained to be started.

Housing - 18 measures combining performance and lifestyle

To reduce the demand of electricity, Heidelberg has adopted its own electricity consumption standards for new buildings as of 2010 (66 kWh/m² per year) and established "[conversion areas](#)" in 2016. These 180 hectares require new buildings to be passive in energy, to use rooftops for solar energy production, and to provide schedules the renovation of existing buildings.

A large share of these areas will be low-cost segment flats. Various renovation projects are carried out with the municipal housing association representing 15% of Heidelberg's rental apartments, mostly built during the 1950-1970 period: renovation, reinforced standards, renewable energies, etc. Heidelberg has also voted 400 grants for the insulation of exterior walls and roofs in these cooperative, representing a saving of 27 ktCO₂ in four years and is addressing energy daily use by supporting 400 low-income households to save energy. Eventually the Council offers up to 12,500€ in subsidies for the conversion of a house to passive energy ([Graczyk, 2015](#)).

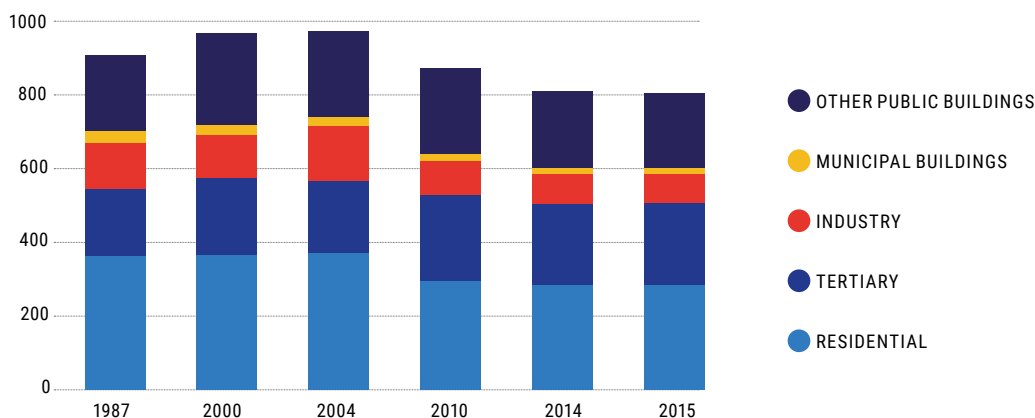
The flagship project of Heidelberg is the Bahnstadt district with 6,500 homes: once completed in 2022, it will be the largest complex of passive housing in the world, with a size of over 100 hectares and a capital investment of €2 billion, 300 millions of which are investments into infrastructure. Various techniques are used to make the best use of natural ventilation, solar energy, rainwater, etc. ([C40, 2017](#)).

To achieve municipal goals, IFEU's assessment of the Masterplan recommends stimulating further deep renovation of existing building and reminds that the supply of heat accounts for around 70% of final energy consumption and half of CO₂ emissions.

Energy – The "Green district heating" concept and the "Solarkampagne"

The residential sector saw a decrease of about 20% in its emissions between 1987 and 2015, as well as a drop in its final energy consumption, while the available per capita surface area increased by 16%. Since electricity-related emissions have increased

GHG EMISSIONS OF HEIDELBERG 1987 - 2015 [EN KTCO₂] Source: Author's construction based on data provided by the IFEU 2017 report.



(calculated based on the national mix), this decrease is therefore related to both the production and use of district heating.

As 50% of the heat demand of households and companies in Heidelberg are supplied by the district heating grid and operated by the municipal utility Stadwerke Heidelberg, the city can have high impact on energy decisions. The concept of "[Green district heating](#)", developed by the municipality and the Office for the Protection of the Environment, has reached in a short time 20% of renewable energy in the network. The Pfaffengrund wood-fired plant supplies 14% of annual requirements and saves 32 ktCO₂ per year, while 4 biogas plants combining heat and energy, supply another 6%. Natural gas cogeneration provides the remaining 80%.

As for electricity generation, Heidelberg focuses on solar energy, through incentives, information and pilot projects. The "[Solarkampagne](#)" started in the spring of 2018 and targets builders, owners and co-owners.

It offers homeowners and co-tenants extensive information on energy efficiency, solar panels, storage and financing, provided by trained consultants trained on purpose by the Heidelberg's The Climate Protection and Energy Consulting Agency ([Neckar-Kreis "KliBA"](#)), and the Heidelberg Energy Cooperative. The city has thus achieved its goal of equipping 7,000 households with solar panels by 2020.

Finally, Heidelberg has deepened its cooperation with an energy citizen cooperative that is active in a project where it acts as a "mini utility", cooperating with the local distribution system operator to allow the 116 residents of a cooperative housing block equipped with 7 PV systems, to collectively self-consume the onsite-produced energy at a cost-efficient price and buy any residual power from the grid ([Energy Cities, Heidelberg, 2019](#)).

Mobility – A master Plan in the Metropolitan Area of the Rhine-Neckar

Heidelberg has the largest share of cycling in the country with 26% of trips made by bicycle, according to a [national survey](#) conducted in 2018. A total of 64% of trips are by bike, on foot or by public transport. Several measures have been taken in the framework of the Masterplan and the Metropolitan Plan to accelerate modal shift and the decarbonation of vehicles:

- 1,000 bicycle parkings at the central station and rental or subsidy for the purchase of cargo bikes;
- introduction of the first electric buses in 2019 at the scale of the Rhine-Neckar metropolis;
- grants of € 1,000 for the purchase of a low-carbon motor vehicle (electric, natural gas or hybrid), and up to 10,000 for a hydrogen vehicle ([Rhein Neckar-Zeithung, 2018](#));
- conversion of the municipal fleet to the electric car and hydrogen and equip the city with dedicated charging stations, and 2 electric vehicle charging stations installed.

In 2017, the cities of Heidelberg, Ludwigshafen and Mannheim jointly developed the "Masterplan sustainable mobility for the city" with the support of local transport associations VRN and RNV to minimize traffic emissions in the Rhine-Neckar metropolitan region. In 2018, a 22-kilometer, intersection-free cycle route project between Heidelberg and Mannheim was launched, with the participation of Baden-Wurtemberg, the Rhine-Neckar Metropolis, and several districts ([RNZ, 2018](#)). This flagship project is accompanied by a multitude of ongoing connections in the city and with neighbouring municipalities.

However, Heidelberg's CO₂ balance will have to absorb the additional burden of the federal A5 widening project in the Heidelberg urban area. In addition, just under a third of the traffic in Heidelberg is transit traffic, over which the city has relatively little influence.



KAOHSIUNG

POPULATION: 2 775 318 (2018)

GHG OBJECTIVES: 20% BY 2030; -50% BY 2030; -80% BY 2050 (BASELINE: 2005)

SCOPE 3 AVAILABLE

Enhancing energy autonomy in industry

Climate policy governance and integration

The Municipal Government of the city of Kaohsiung shaped its first [Adaptation to Climate Change and Sustainable Development Plan](#) in 2015, split between mitigation and adaptation. The implementation of necessary measures to achieve the objectives of each theme is allocated to different municipal secretariats including: the office in charge of economic development, environmental protection, agriculture and public works. For each of these 6 themes, short, medium, and long-term goals were set.

The government of Taiwan does not directly intervene in the implementation of the plan, but it does help shape it by providing [guidelines for local authorities](#), as well as the necessary data. Finally, the State intervenes beforehand by co-funding certain green energy development projects or water outlets. The adaptation section in the plan is subdivided into 'issues' the city faces: disaster resilience, infrastructure, health, coastal zones, water resources, energy, land use, agriculture, and biodiversity protection.

Climate policy tracking

Since 2005, Kaohsiung began annually tracking its greenhouse gas (GHG) emissions. The 30% reduction target by 2020 compared to 2005 remained in force [until 2016](#), before being reduced to 20%. Between 2005 and 2018, the municipality managed to reduce its emissions by 13.23%.

Between 2005 and 2017, Kaohsiung's carbon footprint was lowered by 13.07%, going from 67 to 58 million tonnes of CO₂eq (MtCO₂eq). In 2017, GHG emissions in the city were mainly due to its industry sector (45%), then transport (13%), commercial buildings and housing (8% each). The remaining emissions are caused by agriculture and land use.

Mobility – A shy modal share of public transport

In Kaohsiung, the most popular means of transport of inhabitants is the motorcycle (61.3% of trips), followed by the private car (20.5%). Public transport, walking and cycling represent 7%, 4.5% and 5.4%. In 2016, 172,400 daily commutes were by metro, representing a 4.5% increase compared to the previous year. The rise

in the modal share of public transport is a result of programmes such as "[Live your best life in Kaohsiung](#)", that contains fare integration measures for all means of transport or even educational measures that should enhance a modal shift.

Low-impact mobility is supported by a general improvement in the condition of pavements, making it easier for pedestrians to use them and restricting motorcyclists from parking on them. In 2015, a 755 km network of cycle lanes was built, and the city aimed for a total of 1,000 km by 2018. A bicycle rental scheme called [C-bike](#) was also set up.

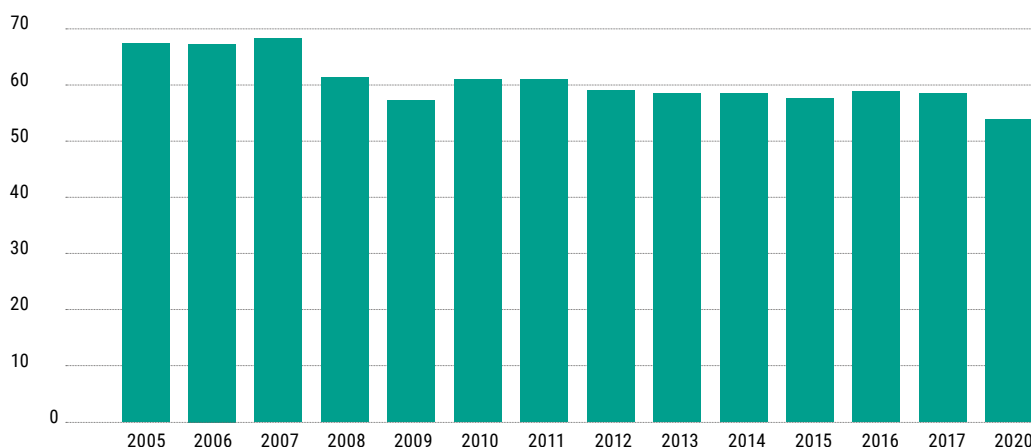
The municipality of Kaohsiung works to increase the number of electric vehicles, as much for the bus fleet as for cars and motor scooters. In 2018, 9.7% of the fleet was electric. To achieve 100% by 2030, in addition to subsidies for the purchase of electric motor scooters and bicycles, there are fuel tax reductions for electric vehicle owners. Therefore, between 2016 and 2017, 150,000 two-wheel vehicles were removed from circulation whereas 6,020 new electric motor scooters were purchased.

In 2017, during the EcoMobility Congress organised in Kaohsiung by the network of cities, ICLEI, the participating cities adopted the "[Kaohsiung Strategies for the Future of Urban Mobility](#)", focused on 3 main axes: public transport, electric vehicle and citizen awareness-raising to enhance the modal shift. The historic district of Hamasen was closed off to traffic during the entire congress.

Energy – Taiwan's pioneer city for the development of "green" energies

To limit the capital share of CO₂ emissions caused by industry, the municipality of Kaohsiung has developed green sources of energy and self-sufficiency. With a high sunlight rate in the area, this policy transformed the city into a pioneer in the Asian solar sector. In 2010, the municipality inaugurated "[Kaohsiung Science Park](#)" cluster, a place of innovation for LED and solar technologies as well as biotechnologies. It is also the largest solar photovoltaic plant in Asia, with a capacity of 1 to 10 MMW. One year earlier, in 2009, the municipality inaugurated its [solar stadium](#), covered in a total of 8,844 solar panels making it 100%

KAOSHIUNG - GHG EMISSIONS (MTCO₂)



self-sufficient in energy. The “left-over” energy from the stadium can supply up to 80% of the district’s energy needs, therefore preventing 660 tonnes of CO₂ emissions every year. In 2012, the municipality defined its [law on photovoltaic buildings](#) with the aim of encouraging solar panel installations on roofs across the city, as well as a yearly production of 19.92 million kWh, or 12,400 tonnes of CO₂ (tCO₂) per year completely avoided.

Kaoshiung also pioneered the development of biogas technology, with the construction in 2000 of the [Hsichingpu methane power plant](#). The plant powers 4,600 households and enables the reduction of the 5,000 tCO₂ per year.

Housing: a rigorous local regulation

The 2012 “[Kaoshiung City Green Building Autonomy Act](#)” regulates the construction of all new buildings in a more binding way than national law. All public use buildings (owned either by public or private actors), in the process of being built or renovated, are concerned by the regulation. The requirements differ according to the size of the buildings, but this includes: installation of solar panels, green roofs, improvement of thermal insulation, rainwater harvesting systems, use of ecological building materials and installation of bicycle garages.

The city encourages more environmentally friendly buildings for which it is easier to obtain a licence. In 2013, 230 building permits were issued enabling the installation of over 31,788 m² of green roofs, an increase in solar energy production of 4,616 kWp, the creation of 1,657 new parking spots for bicycles and the equivalent of 16,200 m³ of rainwater harvesting tanks. Between 2011 and 2013, the greening of roofs led to a reduction of 1,402.64 tonnes of CO₂.

ADAPTATION

GIVING LIFE TO VERTICAL FORESTS

To combat the heat that highly affects the city of Kaoshiung during the summer, due to its tropical climate, the municipality has decided to encourage all residents with balconies to start planting flowers, shrubs and other plants to refresh the structures and create “vertical forests”. In 2018, some 400 households had requested this installation over a total of 180,000 m².

To cope with the high risk of flooding, 15 urban water retention basins have been built. These basins reduce peak flooding, hold groundwater, preserve housing and provide leisure areas. They have said to have [reduced flooded areas by nearly 80%](#).



LARNACA

POPULATION (2015): 84 900 (URBAN)

2020 MUNICIPALITY TARGET: -25.3% CO₂ 2030: -40% CO₂

BASELINE 2009

SCOPES: 1, 2

Managing natural resources while sustaining territorial attractiveness

Climate policy governance and integration

Larnaca is concerned with the protection of its natural and cultural heritage, which concentrates its potential for tourism. The natural and strategic geography of Larnaca accounts for its attractiveness: with its international airport, major seaport, and marina, the city constitutes the country's economic force.

The Larnaca Greater Urban Area, covering 6 municipalities, displays its environmental concerns by initiating programmes focused on the sensible use of natural resources and energy efficiency. The strategic plan for sustainable development [LARNACA 2040](#) outlines its objectives from 2014 onwards to reinforce the city as an energy hub, strategic gateway, tourist destination, and opportunity multiplier.

Its [Sustainable Energy Action Plan \(SEAP\)](#) outlines 23 [local measures](#) to achieve this goal. Larnaca also [contributed](#) to national objectives by participating in the National Scheme for Energy Saving in Street Lighting, aiming to achieve 44% of energy savings by 2021. The national scheme was not renewed, and the matter became the responsibility of the local authority which began working with Energy Authority Cyprus to replace close to 8,000 current street lighting lamps with LED light bulbs, enabling over 2,300 MW of energy savings per year.

Climate policy tracking

Although the 2008 economic crisis accounts for an atrophied economy that partially explains reductions in both energy consumption and GHG emissions, data shows important reductions that imply policy commitments and coordination. Indeed, Larnaca reduced its global emissions by 28.7% from 2009 to 2014 (from 390 to 278 MtCO₂e). Over this period, Larnaca's overall energy consumption fell by more than 25%, from almost 1 GWh for 2009 to 723,504 MWh for 2014. This decrease is largely due to the reduction of fossil fuel use.

Energy – Efficiency through behaviour change

Larnaca strives for energy autonomy. Hence, the municipality considers in its strategic plan [LARNACA 2040](#) energy savings and the shift towards renewable energy sources as pivotal. Larnaca Municipality participated in the [FIESTA project](#) (funded by Intelligent Energy Europe), saving almost 60 MWh of energy and reducing emissions by 51tCO₂ through efficient heating/cooling systems and behaviour change.

However, local energy production remains limited, and while local renewable energy production represents less than 0.1% of it, it recently jumped five-fold from 148 to 739 MWh/year from 2009 to 2014. 2 photovoltaic parks of 150 kW each opened between 2014 and 2016. Compliance with 2020 objectives appears to be attainable for the city of Larnaca if its economic recovery has not resulted in energy consumption or GHG emissions increases.

Mobility – Reversing cars' and bikes' modal shares

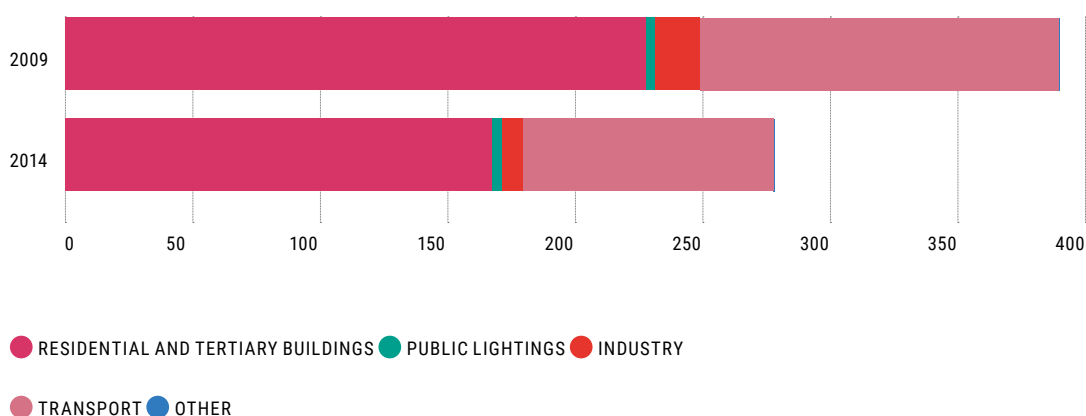
Larnaca's Greater Urban Area Sustainable Urban Mobility Plan "[SUMP FOR LARNACA](#)" in 2018, strives to improve urban liveability through the promotion of non-motorized mobility options. [As of 2019](#), an estimated 76% of households own 2 or more vehicles, and 32% at least 3 private cars mostly used for commutes. In contrast, barely over a third of households own a bicycle. To bolster their use, the city plans to add 43 km of [bike lanes](#) to the existing 25 km.

As part of Larnaca's [SEAP](#) efforts, low CO₂-emissions vehicles benefit from low taxes and subsidies, all electric vehicles park freely, and infrastructure has been renovated and improved: 2 electric car charging points, one-way roads, etc. Larnaca participates in the [European Mobility Week](#) since 2002, when it was first introduced as Car Free Day, and has received 5 distinctions for efforts in awareness-raising and sustainable mobility.

Beyond city bounds, Larnaca's [infrastructure network](#) is integrated within its regional context with 17 regional lines (and 8 regional night lines) exist. The Larnaca International Airport reduced its CO₂

GHG EMISSIONS OF LARNACA PER SECTOR (IN KTCO₂E/YEAR)

Source: [Larnaca Progress](#) retrieved from *Covenant of Mayors for Climate & Energy (2018)*



emissions and its [energy consumption by 32%](#), thus attaining Level 3 “Optimisation” of the [Airport Carbon Accreditation](#).

Natural resources – Managing resources to sustain sustainable tourism

A number of environmental protection projects have been deployed: the initiative “[Larnaca puts an end to plastic straws](#)”, a [beach clean-up](#) in the context of a green international marathon, or the installation of [underground bins](#) along beach areas are among the most mediated. Larnaca’s strategy is not only to solve the aesthetic issue of traditional bins, but also to ensure that the 64 collection points installed before September 2019 are located strategically to improve the rate of recycled waste. The €1.5 million project (cofinanced by Larnaca City and the Ministry of Environment) includes the renovation of the city’s lorries, as well as equipment for local business. Every 3 months, results of recycling are monitored based on the weighed amount of gathered material.

Mindful of environmental preservation while striving to preserve touristic attractiveness, Larnaca is shifting towards more sustainable alternatives, such as [agrotourism](#). ANETEL, the Larnaca District Development Agency, developed the [ALTER ECO](#) project (2016-2019) to enhance the local sustainable development of tourism by promoting the Mediterranean identity. The [Environmental Information Centre of Larnaka Mountainous Area](#) was also created to preserve and protect the environment through awareness, as was the Observation Kiosk of the [Larnaca Salt Lake](#) (one of Larnaca’s remarkable sites). Additionally, Larnaca citizens call for the [relocation of petroleum and LPG facilities](#), which would free a large part of the city’s beachfront.

Larnaca is also taking the lead regarding research, by hosting the new [Cyprus Marine and Maritime Institute \(CMMI\)](#) which focuses its research on the

blue economy, and on a set of missions related to climate and environment (plastics-free oceans, a zero emissions ship, a monitoring system of the land-ocean interface, etc.).

ADAPTATION

COUNTERING THE IMMEDIATE EFFECTS OF CLIMATE CHANGE

Parts of Larnaca are located 2 metres above sea level, making the region the [most vulnerable part of the island to coastal erosion and flooding](#), aggravated by damaging human activities (urbanisation, beach mining). 23m of beach have been lost in the past few years (1m/year), as per 2013 estimates.

Sea level rise causes safety threats for infrastructure while increasing the demand for costly coastal defences, such as breakwaters: 6 parallel ones were built from 2009 to 2018, and 16 others are under construction. These are financed by the national government, which is responsible for maintaining beach fronts. Experts, however, are concerned over the perturbations these breakwaters may cause to natural currents by creating stagnant waters. They recommend switching construction materials from the island’s rocks to construction waste to build artificial rocks. In parallel, the Water Development Department is implementing [various other measures](#): protection dams, surface water routes, flood prevention technologies, etc.

Cyprus is very [prone to droughts](#): water restrictions were imposed, yet Larnaca remains undersupplied (70%). Combined with the unsatisfactory storage of water in dams, a Sea Water Desalination Plant ([SWRO](#)) was needed to supply Larnaca and its surroundings with drinking water.

LJUBLJANA

INHABITANTS: 292,988

2020 TARGET: -21% OF GHG SINCE 2008

2030 TARGET: -30% OF GHG



Stricking a balance between nature and city

Climate policy governance and integration

The “[Ljubljana Vision 2025](#)” (2007), recognised the limitations of the available environmental capability of Ljubljana and the necessity to connect the different ecosystems. This vision is now being followed up in the frame of the Environmental Action Programme 2014–2020. Ljubljana received in 2016 the “European Green Capital Award” for its consistent records of achieving high environmental standards, and “[Ljubljana for you](#)” 2015 compiled for the occasion the implemented actions.

The City of Ljubljana is now preparing its first Sustainable Energy and Climate Action Plan (SECAP) within the Covenant of Mayors and should be adopted by 2020. There is no national legislation making local climate plans compulsory for Slovenian local governments, but 36 cities are part of the Covenant of Mayors process.

Climate policy tracking

In 2017 and 2018, a general increase in the use of energy source occurred. The increase of use is present in all sectors (except in agriculture) which is primarily due to further economic growth and new inhabitants in the wider urban area. Total energy consumption in Ljubljana grew 1.5% in 2017 – 2.7% for energy converters, 2.6% in the industry sector, 0.8% in the transport sector and 0.9% for other energy use. In the Agriculture sector, which represents a minority share of energy consumption, consumption fell by 2.7%.

In 2017 the estimated total value of CO₂ emissions increased by 1.1%, or approximately 25 tons, compared to 2016, because of increased energy use. A rise is also expected in 2018, by around 6.7%. CO₂ is prominently emitted by the energy transformation (electricity and heating 39.5%) and transport (38.9%) sectors, accounting for more than 78% of total CO₂ emissions in 2017.

With increasing traffic, regardless of the fleet structure and emission standards, CO₂ emission levels continue to climb. CO₂ data from motor vehicles by type of fuel (diesel / petrol) show a rise in CO₂ emissions due to an increase in diesel-powered vehicles within the city.

Urban planning - A strong interaction between the built and natural environments

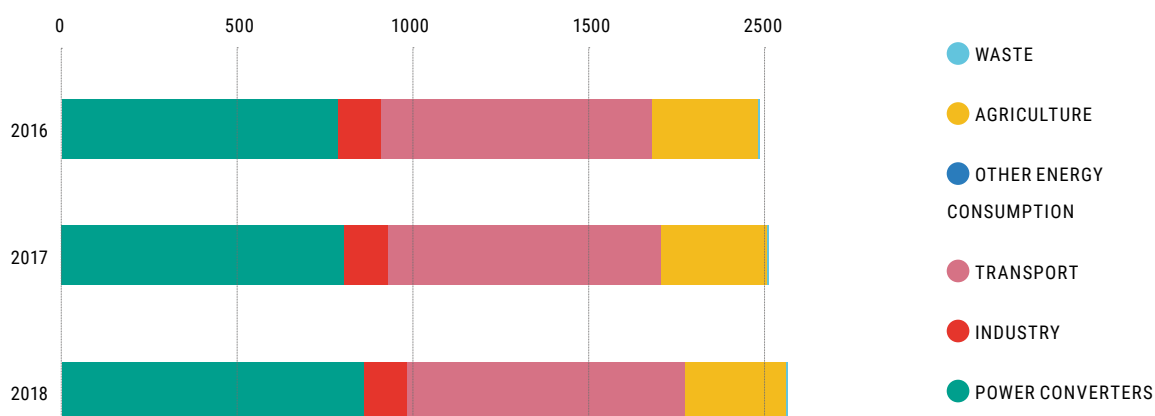
The [FAO](#) revealed in 2018 that natural forest still covers over 46% of the municipal area, and Ljubljana residents enjoy 70m² of green areas per person. 92% of this forest is privately owned. Involving and educating people about forests is therefore crucial. For this purpose:

- The City declared about 1,150 hectares (5% of the total land area) of the forest as “special-purpose forest” ensuring public access and dedicated to recreation and physical and mental fitness.
- The instrument of land purchase created in 2014 by the City, aimed at interlinking the entire urban and peri-urban forest through a network of paths, trails, skid roads and other forest infrastructure by setting priorities in terms of the public interest to be fulfilled for private acquisition.
- The establishment of an environmental education centre called “Forest of Experiments”, allows researchers to share knowledge to schoolteachers, or to wider public through the forest “classroom”.

Similar planning perspectives have been adopted to renovate riverbanks within the city: bridges for pedestrians, cyclists, riverboat piers, and to transform brownfields into green areas. Citizens have been given the possibility to rent a garden plot on municipal land, gardeners are in touch with owners of private land ([Ljubljana](#), 2015).

As for buildings, €14.8 million have been invested in the Energy-saving retrofits of public buildings, in accordance with Slovenian national legislation and EU Cohesion policy ([EOL1](#)): 48 public buildings (educational, sports, health, administration, cultural) were energy retrofitted, among which 25 deeply energy retrofitted (51% of investment covered by private partners, 40% by Cohesion funds and 9% by the COL) and 23 partially retrofitted (51% invested by private partners, 49% by COL). Deeply retrofitted buildings imply 25% share of energy from renewable energy sources. EOL1 contributes to annual energy savings through improved energy efficiency (8.245 MWh or 1 million euros) and the reduction of GHG emissions that amounts to 2,956 tons (about 150,000 trees or 340 ha of forest).

LJUBLJANA - GHG EMISSIONS BY SECTOR (KTCO₂)



Waste – A strategy rather organisational than technological to achieve zero waste

The city operated a major shift in its waste management policy in less than two decades. From 100% of waste going to landfills in the early 2000s, 68% of it is now recovered material. Ljubljana is even the first European capital to commit to going zero-waste with the intermediary step of separation rate 75% of waste by 2025. First, the separate collection for paper, glass and packaging was introduced, before collecting biodegradable waste door-to-door and opening two household waste collection centres where citizens' cars dispose of their rubbish and where reusable items are cleaned and sold again ([Guardian](#), 2019). The city also reduced the frequency of collection of residual waste by half, encouraging people to separate their rubbish more efficiently.

In terms of technology, in 2015 the city built the most modern plant in Europe for treating residual and biological municipal waste: The Regional Centre for Waste Management (RCERO) Ljubljana. The centre uses natural gas to produce its own heat and electricity and processes 95% of residual waste into recyclable materials and fuel. Separately collected organic waste is treated to become compost. RCERO Ljubljana as the biggest project in Slovenia, funded by the European Union through a cohesion fund, prioritizes better practices of waste management and reduces landfill quantities and therefore methane emissions.

Mobility – Towards an equal modal share between car, public transport and low-impact mobility

The first "ecological zone" in Ljubljana was created in 2007 in the old city centre. This entailed closing an area of around 100,000m² to motorised vehicles, and the refurbishing of the area and the main traffic artery to make it more attractive for pedestrians and cyclists. The new traffic regime of this area allowed black carbon levels to fall by 58% ([Ljubljana for you](#), 2015).

Within the European project [Civitas Elan](#) launched 10 years ago, Ljubljana took 17 measures, with the objective to shift the current modal share (67% private cars, 33% public transport, 20% walking and cycling) to an equal repartition among these 3 modes of transport by 2020. The first phase focused on providing efficient and customer-friendly buses with hybrid, methane or natural gas (many old buses have been replaced with 5 hybrid and 20 CNG), then on extending cycling facilities and parking spaces, as well as pedestrian zones. Lastly the 24-hour bike-sharing system [BicikeLJ](#) (introduced in 2011) exceeded all expectations, with over 3.7 million journeys made ([ICLEI](#), 2017).



CITY OF MILTON KEYNES

INHABITANTS: 230 000

OBJECTIVE 2020: -40% OF GHG EMISSIONS SINCE 2005

OBJECTIVE 2030: CARBON NEUTRAL

OBJECTIVE 2050: CARBON NEGATIVE

SCOPE: 1 AND 2

Involving citizens with multiple digital tools

Climate policy governance and integration

Milton Keynes has the ambitious objective of becoming “the Greenest City in the World” as set out in their newly published [2019 – 2050 Sustainability Strategy](#). The strategy is a short refreshment of the 2014 action plan [Imagine MK2050 Strategy](#), an energy reduction roadmap compiling several actors’ contributions (academics, private actors, citizens, and community organisations), and as an output of the European Regional Development Fund (ERDF) initiative IMAGINE, for which Milton Keynes was one of the 10 pilot cities.

Despite the role given to local authorities in the [Climate Change Act 2008](#), the UK legislation does not impose local governments to produce action plans, nor emissions inventories anymore. However, main cities are required to produce an energy efficiency plan supported by [Energy Saving Trust](#). EST is a government-sponsored initiative from 1992 devoted to promoting energy efficiency and reduction for households as well as companies and local authorities.

Climate policy tracking

Despite a relatively small population increase (approximately 2.7%), the total domestic emissions in Milton Keynes have reduced by 87.7kt CO₂ (18%) between 2012 and 2014 to reach near 400kt of CO₂. Similarly, since 2005, emissions per capita decreased faster than total emissions, by 32% from 7.8 to 5.3 tonnes of carbon emissions per person in 2014 ([MK](#), 2018).

The projected total domestic emissions in 2020 is set at 360kt CO₂ in 2020. The city aims to be carbon-neutral by 2030 but mostly focusing on energy efficiency and mobility.

Energy Efficiency – Empowering citizens with a special attention to vulnerable households

The national legislation¹ requires Milton Keynes to report every 2 years on the improvements of energy

efficiency for houses with particular attention payed to poor households in areas off the main gas grid which covers 90% of households. Home Energy Conservation (HECA) Reports involve a production of [energy maps of the city](#), a review of relevant policies and plans, and recommendation for the Council for further effective measures. The last 2017 Progress Report shows that 6% of households (6,500) were still considered to be in fuel poverty, but that two thirds of cavity wall domestic houses (which represent 76% of MK’s domestic housing) have been insulated. To carry out further regeneration, a new company, [Your MK](#), has been formed, as a partnership between Milton Keynes Council and Mears Group PLC. Your MK currently provides repairs and maintenance to the Council’s housing stock (HECA 2017).

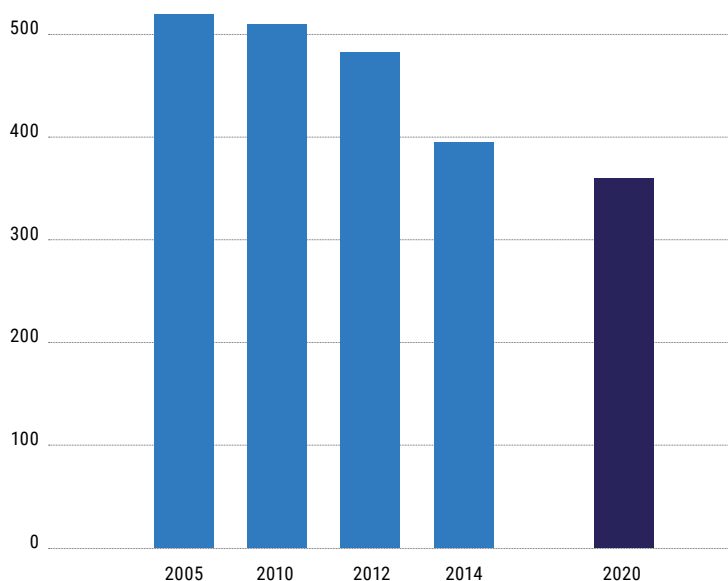
To further address energy poverty, the Council funded the [Green Star Energy Cosy Homes](#) that helps citizens who are most vulnerable, offering expert advice, support services, improvements assessments, and grants for energy efficiency measures. Milton Keynes plans to leverage private sector financing to support the regeneration of its poorest estates.

Lastly, MK acts as an interface between actors and citizens to facilitate energy efficiency projects through several platforms such as [“Efficient Houses Tours”](#) offering public visits, a free helpline [“Keep Warm MK”](#) for energy savings advices. [CAPE](#), the Community Action Platform for Energy project, is the flagship multi-actor partnership between the Council, and various private and research actors. It aims at reducing energy bills for residents and emissions from buildings by developing an interactive website designed to assess energy use for individuals and communities in Milton Keynes. It provides users with data and information on energy choices using satellite imagery. The first community field trial occurred in 2017 on the Lakes Estate district to swap community members’ bulbs for LED lightbulbs ([Community Action:MK](#), 2017).

¹ [The Home Energy Conservation Act 1995](#) (‘HECA’) requires all 326 local authorities in England to submit reports to the Secretary of State demonstrating what energy conservation measures they have adopted to improve the energy efficiency of residential accommodation within their area.

MILTON KEYNES - CO₂ EMISSIONS 2005-2014 [KTCO₂]

Source: Home Energy Conservation Act Progress Report 2017



Mobility – A preference for soft incentives over restrictions

As a recent city built in 1967, Milton Keynes is designed for cars, making the shift towards sustainable mobility difficult. [The Living Streets Community Project](#), funded by the European Commission's Life programme, is a first step towards car restriction and change of habits. The project temporarily transforms streets into community areas with space for neighbours and families to socialise. The municipality had to cope with residents' opposition, so meetings were arranged with local clubs, residents' associations, to share mutual goals and benefits ([Energy Cities](#), 2018). To bolster the use of the 250 km "redways" dedicated to walk and cycle, "Beat the Street" programme supported by the UK government, turns cities into a game where people earn points as they walk, cycle, and run.

Milton Keynes was part of the consortium [CitiZEN](#), coordinated by Energy Cities along with 5 other cities all over Europe from 2015 to 2017. The purpose of the project funded by the 'Europe for Citizens' programme, is to create a permanent working group on mobility which recent achievements are to be highlighted:

- The electric bus scheme has been successful and in 2016 Milton Keynes was awarded a Government grant to increase the fleet by a further 11 buses;
- [Self-driving small pods](#) (autonomous vehicles) have been tested out in Milton Keynes, as part of the "[Catapult Transport Systems](#)" mobility research programmes;
- The MK:Smart project has produced the [MotionMap](#) app, providing citizens with information on parking availability, traffic congestion, and public transport.

Concluded in 2017, the project was followed up by CityLabs – a collaborative place for SMEs to work with academic and industry leaders (ERDF, The Open University, ZTE, and Fronesys) to develop new digital products and services.

Finally, MK also received 9 million pounds in 2016 for a national grant scheme, "Go Ultra Low City Scheme" of the Department for Transport, which aims to boost electric car. MK has thus created an [Electric Vehicle Experience Centre](#) – a 'one stop shop' providing consumer advice and short-term vehicle loans – which opened up 20,000 parking bays for free to EVs; installed charging hubs; priority in bus lanes. Milton Keynes now has over 250 charging posts and 70 rapid chargers.

ADAPTATION

ADDRESSING AND ANTICIPATING WATER SCARCITY

[POWER](#) (Political and sOcial awareness on Water EnviRonmental challenges) is a 4-year [Horizon2020](#) funded project and coordinated with De Montfort University (2015/2019), covering 4 European pilot cities. In Milton Keynes the project focused on water management. POWER set up a Digital Social Platform where participants will be able to share opinions, progress, best practices, and compare the cities involved. The aim is, thanks to the 'network effect', to enable citizens to make informed decisions and develop local strategies in response to climate change.

Milton Keynes communities now have their own platform, the [Milton Keynes Water Community](#), where events, competitions, and pieces of information are shared.



SANTIAGO DE CHILE

POPULATION: 7,112,808 (2017)

NO GREENHOUSE GAS (GHG) REDUCTION TARGETS

SCOPE 1, 2

An Air Pollution Approach

Climate policy governance and integration

Striking pollution peaks, affecting the entire city since the 1990s, have pushed authorities (the region was declared saturated with ozone in 1996, and with fine particles in 2012) to shape a climate policy, focusing on the reduction of atmospheric pollution instead of the decrease of CO₂ emissions. The first plan was adopted in 1998, and the most recent 10-year-long [Plan of Prevention and Atmospheric Decontamination \(PPDA\)](#), in 2017.

Plans are defined by the Chilean Environment Ministry and enforced by [the Regional Secretariat of the Environment Ministry](#). The plan can be carved into two main parts: permanently applicable measures, and those that cannot be applied when a pollution peak occurs mainly focusing on transport, industry and housing.

Climate policy tracking

The Metropolitan Region of Santiago is the biggest emitting region of Chile with 20% of overall emissions for 37% of the Chilean population. Regional GHG emissions have increased by 141.6% between 1990 and 2016 reaching 22.3 MtCO₂eq. From 2013 to 2016, emissions grew by 16.4% compared to the overall national increase of just 7.1%. [In 2016, the main emitting sources were the fuel consumption](#) of cars, buses and lorries – in other words, the transport sector, representing 41.2% of emissions ([Chili MMA](#), 2019). It is followed by the residential sector, then industry, services and the institutional sector, representing 9.6%, 8.5% and 6% of the city's emissions. On the other hand, electricity production represents just 3.6% and waste treatment 5.5%.

Although the city's emissions rose, [the frequency of days of emission peaks considerably dropped between 1997 and 2017](#). In 1997, 79 days were counted as critical compared to just 3 in 2017. The presence of airborne particles decreased by 72% between 1989 and 2015 for PM_{2.5} particles.

Energy – Renewable energies in public transport

The rising cost of Santiago's metro triggered the social crisis that spread across the county in

2019. This transition to renewables did not get much media coverage, although, since 2019, the metro operator, Metro de Santiago, has been working to reduce its annually [monitored GHG emissions](#). To reduce consumption, several measures have been implemented: the installation of an intelligent lighting system on lines 4 and 4A (estimated 10% reduction between 2015 and 2018) and a braking energy generation system (reducing the traction energy of the metro by 18% between 2015 and 2018). Also, in 2016, [an agreement](#) combining the [solar plant of El Pelicano](#) with the [San Juan wind farm](#), was reached to power the network with renewable energy. Since 2018, 60% of the Santiago metro's energy mix comes from electricity from renewable sources, a system that should enable a reduction of 130,000 tonnes of CO₂ per year. Despite the implementation of ambitious measures, the metro's electricity consumption increased between 2015 and 2018 due to the opening of two new lines.

In 2019, 183 new electric buses are expected to be put to use, bringing the [total number of electric buses in circulation to 400](#). Santiago will therefore be the second-best equipped city in terms of electric buses outside China. This is part of the [2025 Framework Plan on Transport](#), which plans a 10% change in the fleet to electric and 20% to hybrid by 2020, and [100% of the fleet by 2050](#).

Moreover, for inhabitants' daily commutes, low-impact modes of transport are most popular. The survey on household-journeys, carried out in 2015 by the Chilean Ministry of Transport and Communications, reveals that 38.5% of the 18 million daily trips are made on foot or by bicycle. Public transport accounts for 29.1% of the modal share, and the use of private vehicles for 28%.

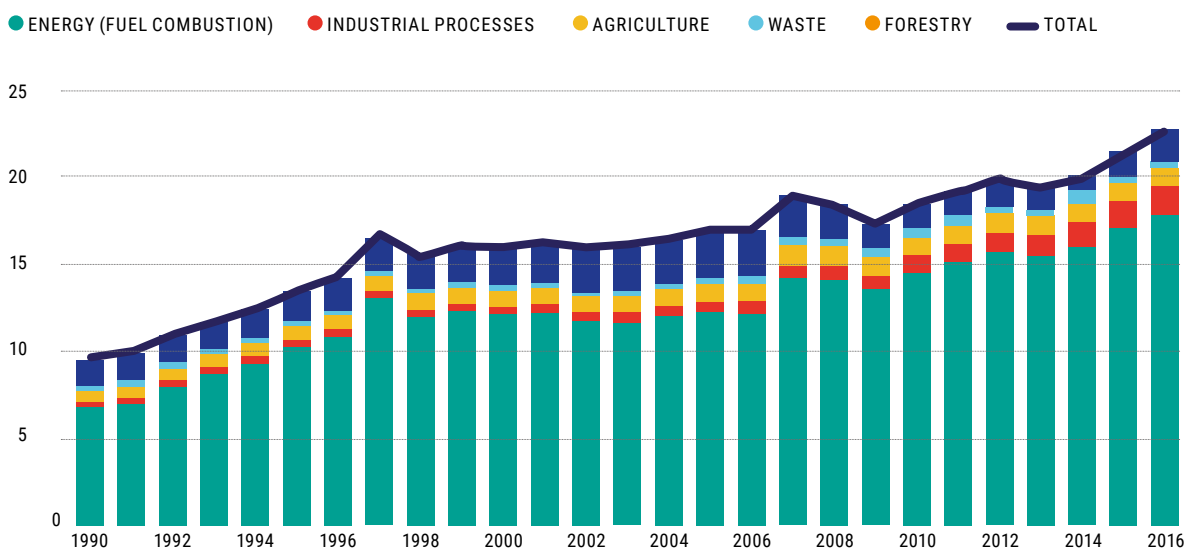
Waste - Municipalities' initiatives

The population of the metropolitan region of Santiago generates close to 1.3 kg of waste per person, daily. In 2016, Santiago funded the [Santiago REcicla programme](#), based on 3 axes: an awareness-raising programme, a study on the implementation of door-to-door collection and the construction of collection points.

However, [some municipalities in the metropolitan](#)

GHG EMISSIONS AND ABSORPTIONS (MTCO₂) BY SECTOR, 1990-1996

Source: MMA Technical Coordinating Team



[region already set up waste collection and treatment programmes](#). The municipality of Ñuñoa was a pioneer in the region as it launched its weekly door-to-door collection system in 2003, followed by an awareness campaign, completed in 2011 with the installation of 800 containers. In 2017, 4,357 tonnes of the 68,000 tonnes of waste produced were recycled, or 6.41% for a population of 195,300. In 2012, the municipality of Lo Barnechea, with a population of 105,833 inhabitants, also fostered a waste management programme, initially with [18 mobile collection points](#) in order to reach more local areas. Each point stays put in a district for 24 hours before changing spots and returning a week later. This system, combined with a partial door-to-door collection system launched in 2017, made it possible in the same year to collect 1,361 tonnes of waste out of 52,000 products, or 2.62% of recovered waste.

Solar energy at the heart of renewable energies' progress

In 2018, 3 substantial photovoltaic plants opened in the metropolitan region: Santiago Solar, [Quilapilùn](#) and [Ovejería](#). The Quilapilùn factory, the vastest of the region, has 350,000 solar panels generating 234 GWh of energy per year. It already produces enough energy to power 110,000 households and should enable a decrease of 125,000 tonnes of CO₂ every year. The Santiago Solar plant, spread over 200 hectares of land, powered 90,000 households.

Santiago also benefits from the governmental programme known as "[Techo Solares](#)". It facilitated the effective and future installations of solar panels on 23 public buildings located in the capital. Fitting

solar panels on the roof of the [San Borka Arriarán hospital](#) granted a reduction of 119 tCO₂eq/year and produces the equivalent of the overall consumption of 166 households. Once [all projects are completed](#), the CO₂ reduction of public buildings in Santiago should be of 1,092 tCO₂eq/year.

ADAPTATION

DEVELOPING A NETWORK OF METROPOLITAN PARKS:

[As a result of municipal and metropolitan initiatives, or thanks to the "Plan Chile Area Verde", Santiago should gain 261 hectares of green space between 2016 and 2022.](#)

In 2014 the Santiago metropolitan government launched the "Cerro Isla" competition to turn one of the city's main hills into an urban park. The winning project was Cerro Chena, that increased the overall size of the park by an extra 20 hectares, reaching a total of 58 hectares and a reforestation plan for 12,800 native species, carried out on 2016, over an area of 15 hectares.

The Chile Area Verde Plan financed the construction of seven new parks in the city, covering an area of over 100 hectares, representing 6% increase in the available green space. They were built in municipalities with the lowest rate of green space per inhabitant. The most significant achievement within the project is the 26 hectare Parque La Hondonada, built on a former landfill site. It is divided between two municipalities with the lowest number of green spaces per inhabitant, Cerro Navia, 2.1m²/inhabitant, and Pudahuel, 2.5m²/inhabitant.



SOUSS-MASSA

POPULATION: 2,700,000

2030 OBJECTIVE: -75% GHG E (BASELINE: 2013)

SCOPE 1

Satisfying new renewable energy demands

Climate policy governance and integration

The Local Plan to Combat Climate Change ("PTRC") of the Souss-Massa region (October 2018), is the first local climate plan of all Morocco that has operationalised at a regional level the National Strategy for Sustainable Development (SNDD). The document outlines how the achievement of regional objectives will contribute to Morocco's Nationally Determined Contributions (NDCs).

In consultation with local actors (interviews, themed workshops, etc.) and coordinated by a steering committee, the PTRC outlines climate vulnerabilities and formulates the region's first greenhouse gas (GHG) inventory. The climate committee is in charge of its implementation and the monitoring-evaluation (Measure, Reporting & Verification (MRV)) of the results. It will be supported by the Regional Information System for the Environment and Sustainable Development (SIREDD).

The PTRC provides a 'bank' of mitigation and adaptation projects representing a total investment €2.98 billion (PTRC, p.41).

Climate policy tracking

Energy emissions (44% of total) mostly originate from transport (45%), from building (27%), agriculture (15%), and industry (10%). As for non-energy emissions linked to agriculture and land use (33% in total), emissions are mostly from enteric fermentation (58%) that could increase by +500% by 2030 in a run-of-river scenario. They are followed by direct and indirect NO₂ emissions from cultivated land (32%) and manure (10%).

The PTRC plans a 75% drop in GHG emissions by 2030 according to forecasts. The electricity demand is currently climbing at a rate of 7% per year. Total energy consumption in Souss-Massa that totalled at 1,476 Ktep in 2013 (including 720 Ktep from oil products and 86 Ktep from coal).

Energy – Enhancing renewables in Souss-Massa

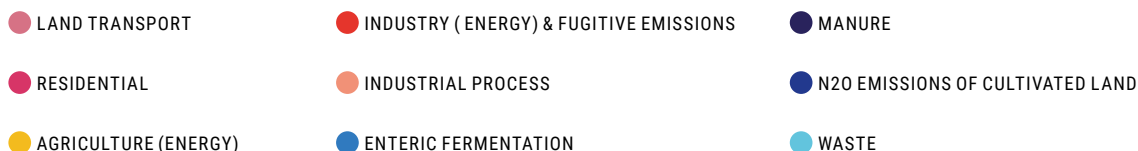
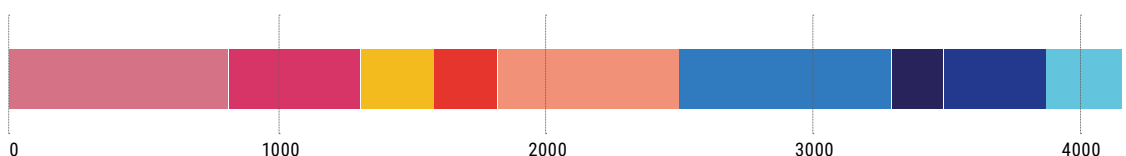
To reach its goals, the Souss-Massa region focuses mainly on the decarbonation of its energy mix and its sunlight rate which is one of the highest of the Kingdom with over 8kWh/m²/day. The solar potential is added onto wind potential on the seafront. The rapid exploitation of this renewable energy potential, with an energy efficiency strategy, should contribute to the region's and country's energy autonomy with a target of 1120 MW of solar energy production by 2030.

Currently the region mainly has pilot projects. The Ibn Zohr University and the Institute for Research in Solar Energy and New Energies (IRESEN) are working with the region to develop photovoltaic potential maps, which should help investors and individuals assess the profitability of projects. UIZ is also developing solar ovens to reduce the use of wood for cooking in rural households. The Abdelmoumen Dam Pumping Energy Transfer Station is expected to have a hydroelectric generating capacity of 350 MW. There is also the 500 MW planned with the solar power plant project. The Noor Tata, which is part of the Moroccan Solar Plan, should reduce emissions by 9 MtCO₂eq.

In 2018, the Regional Council approved a partnership agreement with the Moroccan Energy Efficiency Agency, of which 1.2 million is dedicated to wind energy. This partnership will enable the construction of two wind speed measurement units in the rural municipalities of Ait Wafka (Tiznit Province) and Tamri (Agadir Ida outanane) ([Femise 2018](#)).

As for energy efficiency and demand management, the regional strategy remains at the diagnostic stage. Agriculture has a high potential for energy savings, estimated at 30% in conventional water pumping systems, and 20% in conditioning units. Lastly, the projects led both by the Region, such as the adoption of 70,000 LED photovoltaic streetlights in 10 municipalities in the Region, and by local stakeholders, such as the Atlas Kasbah ecolodge, which avoids 17,900 kgCO₂eq each year, should be noted.

SOUSS MASSA - GHG EMISSIONS IN 2013 (KTCO₂EQ)



Waste – Turning organic waste into a source of energy and employment

Waste represents only 6% of emissions but remains an important issue to reduce plastic on the one hand, and an energy source on the other hand, since most of the waste is organic and from agriculture and horticulture. The 950,000 tonnes of waste from market gardening and citrus fruit production estimated in 2011 ([l'INRA-CRRA d'Agadir](#)), could also solve the problem of soil exhaustion (via biogas or composting).

The PCRT focuses on recovering waste through biomethanisation. This strategy is already used in Greater Agadir, where the rehabilitation of the Bikarran landfill since 2009 has made it possible to generate biogas through waste fermentation. This degassing system (47 wells installed) would have reduced GHG emissions by 68 MtCO₂eq via a flaring system between 2009 and 2015 ([L'économiste](#), 2017). The PCRT is continuing along this path at the regional level with the establishment of a network of regional platforms for the recovery of agricultural waste (200 million dirhams, Mdhs), a biomethanisation project for animal manure (200 Mdhs), and a solid waste 'methaniser' is planned in the Plaine area, south of the coast (100 Mdhs).

Another attempt to rehabilitate know-how is the [agdals](#), systems for preserving common forest and pastoral environments, or tanast systems that enable the Amazigh community to manage and time water distribution and adapt to water scarcity ([Portail Sud Maroc](#) 2016). The Japan International Cooperation Agency (JICA) has introduced a Japanese technique called "Porous Alpha" into market gardening in Souss-Massa, the results of which have shown water savings as well as better yields.

ADAPTATION

WATER RESOURCES, THE REGION'S MAIN VULNERABILITY

Souss-Massa is under increasing water stress due to an ongoing fall in groundwater levels, in parallel with increased flooding risks (260 identified zones). A decrease in rainfall by 10 to 20% is already visible in Anti-Atlas and Tata ([Vulnerability studies](#), 2016), and threatens to speed up the decrease in yields and usable land, mostly rainfed crops, and in oasis systems. 43% of the PCRT's adaptation budget has been allocated to support projects for water resource management ([LesEco](#), 2018).

Several answers have already been provided with stakeholders in the area on both the water demand and supply side. A public-private partnership (PPP) was implemented to improve access to and sustainable management of the Souss-Massa water-table by the 700 farmers in the [EL Guerdane](#) area. Similarly, the seawater desalination station of Chtouka where construction work began in 2018, will be used to irrigate and to fill the artificial water-table of the entire region ([Afrik21](#), 2018). In 2017, according to the regional agriculture Office of Souss-Massa (ORMVASM), 71,000 hectares of the region were equipped with drip irrigation systems in the framework of the Green Morocco Plan ([MAP](#), 2017).



THURINGIA

POPULATION: 2,143,145 (2018)

GHG OBJECTIVES: -60 TO -70% CO₂E BY 2020;
-80 TO -95% CO₂E BY 2050

SCOPES: 1, 2

A decision-making process backed by science

Climate policy governance and integration

Thuringia's 2030 and 2050 greenhouse gas (GHG) emissions reduction goals are inscribed in the [ThürKlimaG](#), the Thuringian 2018 Law on Climate Protection and Adaptation to the Effects of Climate Change. This law is to be reviewed every 5 years based on indicators such as an evaluation of the state government's leadership, the number of municipalities with an energy and climate plan, and on the feasibility of objectives. The [Integrated Energy and Climate Protection Strategy](#) was also developed to help direct policies towards sectors with the greatest potential of GHG emissions reduction: energy supply, transport, and land use.

Keen on expert consultation, Thuringia created an [Advisory Council for Climate Protection and Climate Change Adaptation](#) which advises the Thuringian Ministry for the Environment, Energy and Nature Conservation. Legally inscribed in §14 of the ThürKlimaG, this council is composed of scientists – nominated for 5 years – from a wide array of specialised fields (hydrogeology, meteorology, biogeochemistry, bioenergy). The [Klima-Pavillon](#) is an exchange platform to discuss climate change-related issues (adaptation, nutrition, mobility, energy etc.) through the exhibitions, conferences and actions it hosts.

The state of Thuringia has also set up [Klima Invest](#) to subsidise climate measures in municipalities with starter packages up to €7,500 each, for the modernisation of street lighting, technical efficiency measures in water systems, energy management, renewable energies, and skills development.

Climate policy tracking

Thuringia has consistently been reducing its emissions: in 2013, the state had reduced [its GHG emissions by 61%](#) (compared to 1990) and by 23% between 2000 and 2015 (fig. 1). These emission reductions are due, in great part, to two key sectors: residential and road transport, respectively [-1.21 and -1.27 MtCO₂e/year from 2000 to 2015](#).

Energy - 2nd highest share of renewable energy in gross power production in Germany

Although Thuringia only represents 1.4% of Germany's total power production, [56.9% of its total energy production](#) come from renewables (wind 22,4% and biomass 20%). As for primary energy consumption, renewable sources meet 24% of Thuringia's needs – the second highest share of all German states. Although [a third of electricity is imported](#), as Thuringia's energy generation is very limited because of its very few fossil fuel resources. But as a Under2 MoU signatory, Thuringia aims to [cover 100% of its energy demand](#) by its own renewable energy sources from 2040 onwards.

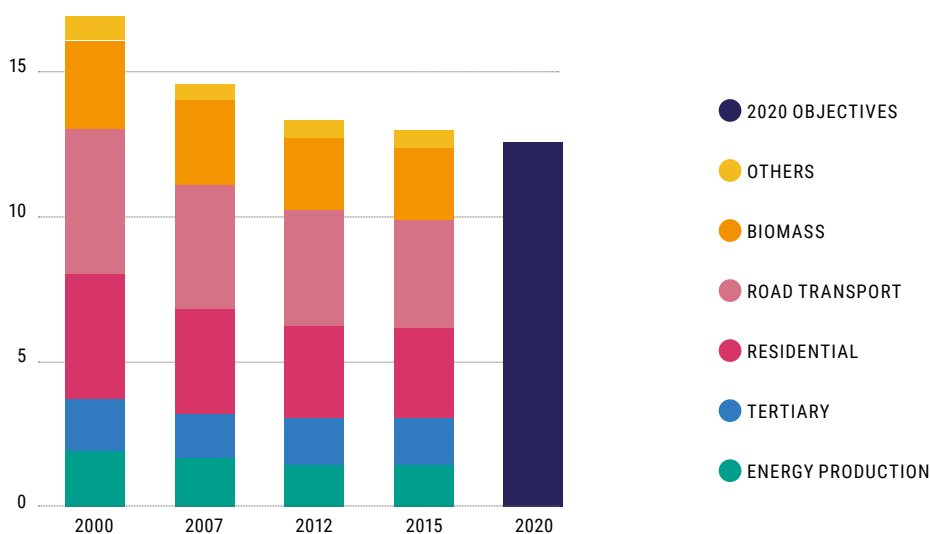
By Thuringian law, the region is granting [1% of its total surface area](#) to the use of wind energy. Over 30,000 households', companies' and municipalities' photovoltaic systems provide about [12% of the electricity generated in Thuringia](#). It is also the German state with the second largest number of energy cooperatives. The [Solar Energy Service Centre of ThEGA](#) (the state energy agency) provides independent advice on such installations, and gives access to its [Solar Calculator](#).

366 Thuringian energy companies have created 60,000 jobs, focusing their work on energy efficiency (26%), solar energy, and on bioenergy. ThEGA also grants yearly [Energy Efficiency Awards](#): in 2019, the top 3 winners of the categories "Climate Protection in Municipalities" and "Energy Efficiency in Companies" were collectively awarded €30,000. One of the state's priorities is to develop [a centre of excellence for solar power production technology](#).

Nonetheless, Thuringia has been the scene of state government [opposition](#) to the construction of the SuedLink power line, a major high-voltage transmission line, to bring wind power from the north based on the refusal to sacrifice natural and cultural landscapes. [Several right-leaning citizen initiatives](#) have also opposed the construction of new wind turbines, in a movement of opposition to the energy transition. As a response, the federal government assured that [grid expansion would be limited](#) to the "necessary level".

THURINGIA - GHG EMISSIONS (MTCO₂e/YEAR)

Source: [Thuringian GHG emissions \(2015\)](#)



Mobility – Intermodality and electrification

Thuringia's climate law is accompanied by an [action plan](#) which defines seven measures to accomplish GHG emissions reduction targets in the transport sector. Prominent features of this plan include: transporting bikes on public transport to foster the intermodality of services; the electrification of the railway infrastructure through electric accumulators or hydrogen fuel cell; an optimisation of the frequency and coordination of public transport services; attractive and group-specific fares; [standardised access and billing systems for charging infrastructure](#); trial periods for electric bikes and cars by commuters.

Thuringia dedicates 20.2% of available ERDF funding from the 2017-2021 project "[Optimisation of Public Transport Policies for Green Mobility](#)" to the reduction of CO₂ emissions, which includes the promotion of low-carbon mobility. The project aims to address all mobility needs of residents and tourists through inter-modal mobility chains, by integrating rail travel and e-mobility (including car-sharing).

To reduce its reliance on extra-EU imports of vehicles' batteries, Thuringia recently signed an agreement with the Chinese company CATL (the world's largest producer of battery cells for e-cars) for the construction of a [new battery cell gigafactory](#) for European-made batteries.

Land Use - Satellite monitoring for policy decisions

The [Thuringian Climate Agency](#) was founded in 2011 and provides regional climate information to a wide array of interested parties, ranging from administration offices to education specialists and policy makers. One of the projects led by the Agency is

[COKAP](#), making use of Copernicus and other satellite data for climate assessments used in the regional and urban planning of Thuringia. Satellite-based surface temperature measurements – made freely accessible by the Copernicus programme – provide 4 data sets that help aggregate indicators such as "heat load in cities" and "summer heat island effects". Another forthcoming indicator evaluating urban climate based on these same datasets will be made available for future urban planning throughout the region.

GIS data finds other environmental applications of remote sensing, as for instance in [afforestation monitoring](#) to evaluate Tree Cover Density and Forest Type so as to generate a map of land uses throughout Thuringia.

ADAPTATION

[IMPAKT II](#) (follow-up of IMPAKT, launched in 2013) is an integrated programme detailing 47 actions in all fields affected by climate change that require adaptation measures. These [actions](#) focus on improving databases and models (by means of research and monitoring), elaborating activity-specific measures such as encouraging the agricultural use of adapted varieties, or developing indicators for monitoring.

ThEGA conducted between 2015 and 2018 the [KlimAdapTIT](#) project, entitled "Development of Climate Adaptation Strategies and Technologies in Thuringia" that helps municipalities to identify required measures, on the basis of a catalogue of measures is tailored for both urban and rural areas, and involve local and regional actors: workshops on health, conservation, construction and civil protection have led to the development of a number of these adaptation measures.

VICTORIA

POPULATION (2019): 6,566,170

2020 TARGET: 25% RE

& -15/20% OF GHGE (BASELINE 2005)

2025 TARGET: 40% RE

2050 TARGET: NET-ZERO GHG EMISSIONS



Placing actors' efforts at the core of policies

Climate policy governance and integration

Victoria is responsible for almost a quarter of Australia's total net emissions (21.7% in 2017). The [Climate Change Act 2017](#) acts as a legislative foundation to manage risks and reinforce resilience in the face of climate change. The Act requires [five-yearly sector-based Adaptation Action Plans](#) to be developed. Every 5 years, starting in 2020, Victoria will state interim targets to comply by 2050 with net-zero emissions; these targets are independently reviewed by a panel of experts. Having set a -15 to -20% GHG emissions reduction by 2020 (baseline: 2005), the current projection estimates the reduction to be of 18.2%: [Victoria is on track to meet its target](#).

Launched in 2016, [TAKE2](#) is Australia's first state government-led pledge initiative: individuals, businesses, local governments, community organisations, schools, and education centres can all take the pledge and commit to Victoria's 2050 targets. 13,000 actors are part of this network, and the programme lists all possible undertakings for each category of stakeholder.

The [Virtual Centre for Climate Change Innovation](#) (VCCCI) was established to foster the collaboration between businesses, industries, researchers, and the Victorian government. The VCCCI has a Climate Change Innovation Grants Programme providing \$4.3 million to support 24 projects that could drive greater investments, such as [increasing soil carbon sequestration in dryland grazing systems](#), or [self-sensing flood resilient smart roads](#).

Climate policy tracking

GHG emissions trends of Victoria have been inconsistent since 2005. However, between 2005 and 2016, emissions overall decreased by 14.1 MtCO₂e, and the state began improving its carbon sinks from 2011, reaching a sequestration of 9.7 MtCO₂e in 2016.

Energy - Supporting solar energy self-consumption

[Victoria's renewable energy action plan](#) sets forth a 2020 objective of 25% of renewable energy use, and 40% by 2025. To deliver on its 2020 and 2025 renewable energy targets, Victoria uses a [reverse auction mechanism](#) to fund renewable energy generation projects until 900 MW. The auction guarantees an output price for project developers via 15-year contracts for 2/3 of the capacity; the rest is exposed to the market.

Victoria's efforts to reduce emissions and improve energy efficiency also include the [Greener Government Buildings programme](#) – a combination of lighting upgrades, solar panels, heating, ventilation, and cooling upgrades, and building automation and controls – which has abated 686,000 tonnes of GHG per year since 2009. Launched in August 2018, the state-level rebate scheme "[Solar Homes program](#)" hopes to increase the solar capacity of residential buildings (for households that have less than \$180,000 of taxable yearly income) to [2.6GW of solar power systems on 650 000 rooftops](#). The offer initially consisted in half-price rebates for small-scale PV installations (\$2,225 subsidies), and [monthly allocations were exhausted within hours](#), which showed the scheme's success (despite some [criticism](#)). The recent return to power of the Labour Party is enabling an extension of the offer with interest-free loans, half-price battery storage, and access to rooftop solar rebates for renters.

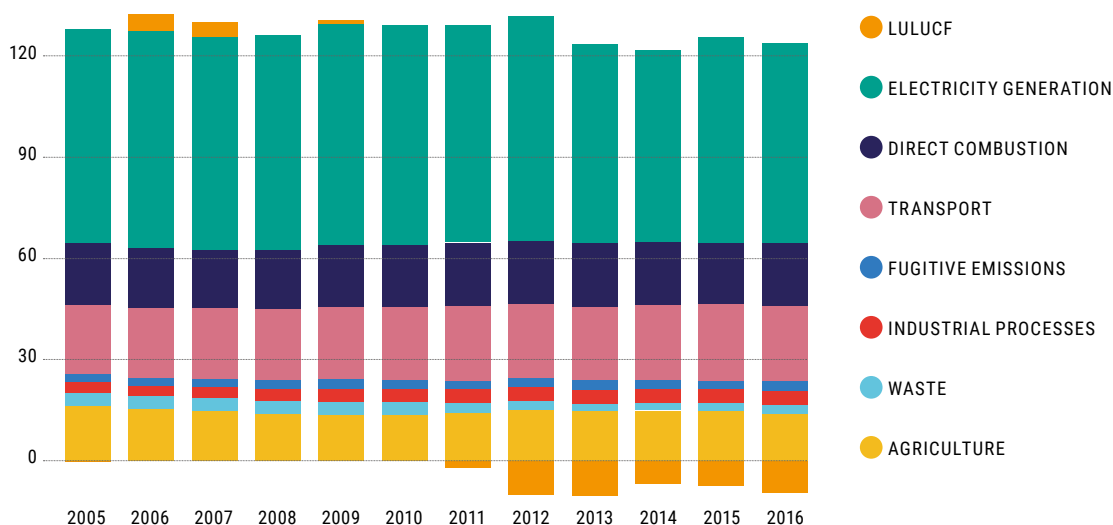
Mobility – Infrastructure investments for individual electric cars

The Victorian Government [fosters low-emissions transport](#): for instance, it has provided funding to support a commercial electric and hydrogen vehicle manufacturing facility, and offered [registration discounts](#) for hybrid and electric passenger vehicles (although only \$100 per registered car).

[Australia's fastest electric vehicle charging station](#) is currently being developed in Victoria. The State Government initially gave \$1 million to Chargefox (the business constructing two sites and multiple charging stations on them, operational before 2019) which the company promised to match. Their success

GHG EMISSIONS AND ABSORPTIONS VICTORIA 2005 TO 2016 (IN MTCO2E)

Source: Victoria emissions by sector, retrieved from [Victorian Greenhouse Gas Emissions Report 2018](#)



led the state government to give another \$2 million to develop 5 additional charging stations. The [Australian Renewable Energy Agency \(ARENA\)](#) also weighed in with \$6 million, out of the project's \$15 million total costs. Charging time is to be dramatically reduced: 15 minutes should be enough for a 400-kilometre drive. Electricity is [100% sourced from renewable sources](#), sometimes from [on-site solar electricity](#) (coupled with battery storage). The hope is that this technology will [boost tourism opportunities](#) by facilitating interstate travel.

Land Uses – Native forests at risk

Victoria's forests are [among the world's most carbon-dense forests](#). In 2016, they provided [net sequestration of 9.7 MtCO₂e](#) representing -8.5% of net emissions. Land is set to remain a carbon sink at least until 2020, but it is expected that the sector's sequestration capacity will be reduced by 25.3% because of the harvesting activities of commercial plantations.

For this purpose, [VicForests](#), the Victorian government's logging business, is allocated 1.82 million ha out of Victoria's 7.6 million ha of native forests. But logging advocates argue that only 450,000 ha (5.7%) of the state's native forest estate are [suitable for harvesting](#). They also argue that buildings and furniture issued from logging store carbon, although most logging products are bound to short-term uses. These short-lived wood products issued from native forests quickly end up in landfills where they decompose and release the carbon they were storing back into the atmosphere. [Illegal logging outside of allocation zones](#) and at hundreds of locations across the state is suspected – meanwhile, the Victorian government does not exclude the [possibility of allowing more logging](#) in its national parks.

ADAPTATION

TOUCHES OF COMMUNITY ENGAGEMENT

After collaborating on climate adaptation from 2013 to 2016 with all 79 local councils through [the Victorian Adaptation and Sustainability Partnership](#), the State government developed [its Climate Change Adaptation Plan 2017-2020](#): it includes a commitment to [6-monthly implementation monitoring, 18-month reviews and 3-year reviews](#).

The [Supporting our Regions to Adapt](#) programme, costing \$9.3 million and funded over 3 years through the Sustainability Fund, focuses on collaborative action between the Victorian government and regional communities. In 2017-18, all 6 DELWP regional offices provided Regional Adaptation Snapshot Reports to help shape state-level policies. The Victorian Adaptation and Sustainability Partnership notably funds [The Rural People: Resilient Futures Project](#) that aims to reduce the vulnerability of Southern Grampians Shire inhabitants whose health and wellbeing may be affected by climate-enhanced phenomena such as heatwaves, fires, and droughts.

The [Department of Environment, Land, Water and Planning \(DELWP\)](#) is improving Victoria's flood warning systems notably with [FloodZoom](#) (which brings together forecasts, mapping, real-time river height gauges and property data).

[Indigenous cultural burning](#) has been reintroduced in Victoria in the hope of revitalising the land and reducing risks of forest fires: 27 cultural burns, undertaken by Forest Management Victoria in collaboration with Dja Dja Wurrung Clans Aboriginal Corporation, are planned from 2019 to 2021.

SECTION III



Around the World in 80 Initiatives



A new open approach on the SDGs

Following in the footsteps of the 2018 edition, the Climate Chance Observatory highlights initiatives from a variety of local public policies that contributed throughout the past year to cities' and regions' worldwide progress in and commitment to their transition towards a new model compatible with climate change. New in this edition: to bridge the gap between climate action and socio-economic issues, "Around the World in 80 Initiatives" is now interwoven with the 17 Sustainable Development Goals (SDGs). Adopted in 2015 by the same States two months prior to the Paris Agreement, the SDGs are key to understanding mitigation and adaptation, taking into account the socio-political demand, underlining potential synergies between the improvement of local socio-economic frameworks and reaching the greenhouse gas (GHG) emission reduction goals.

Local governments at the heart of the implementation of the 2030 Agenda

At the first level of public administration, local and regional governments (LRGs) have been important levers for implementing SDGs and public policies well-aligned with the Paris Agreement goals. Equally, national governments are still finding it hard to involve all infra-state levels in the fulfilment of the Agenda 2030. On this basis, a conclusion of the third annual report "Towards the localization of the SDGs" was published, presented by the Global Taskforce of Local and Regional Governments (GTF) piloted by UCLG (UCLG, 2019).

Published before the High-Level Political Forum 2019 (9th-19th July), the annual summary on the implementation of the SDGs, the report of the GTF states that if 72% of the 158 Voluntary National Reviews (VNR), currently submitted by states on the implementation of the 2030 Agenda, recognise the need for action at infra-states levels, only 38% have consulted local and regional governments in the process. A paradox, in sight of **how local governments that were interrogated in the report made use and assimilated SDGs**: 67% of respondents state having adopted political documents on the application of SDGs, and 75% announced having organised awareness campaigns as well as sharing, training, or capacity-building activities on SDGs. Although the most active cities on the subject are assumed to be the most likely to respond to a survey, these encouraging figures confirm the interest in localising the 2030 Agenda. Bristol's One City Plan is one of the best examples of this in 2019 (Box).

“EXPERIENCE FEEDBACK”. BRISTOL’S ONE CITY PLAN, AN EXAMPLE OF THE INTEGRATED LOCALISATION OF THE SDGS

As First European Green Capital in 2015, Bristol was the first British city to declare the climate emergency in November 2018 and to fix a carbon neutrality target for 2030. The town has already reduced its emissions by 71% since 2005. Bristol’s impressive work doesn’t stop there: in January 2019, the city published the One City Plan, a long-term vision aiming to turn the city into a “fair, healthy and sustainable city” by 2050. The plan, founded during citizen consultations, has the particularity of being entirely based on the Sustainable Development Goals. Structured around six interrelated priority themes (Connectivity, Economy, Environment, Health and Well-being, Habitats and Communities, Learning and Skills), the plan details an important set of 10-year goals for each of them, meeting the targets of the SDGs.

Inspired by the Voluntary Reviews elaborated by States in the 2030 Agenda framework, the University of Bristol published in July 2019 the first “Voluntary Local Review of Progress”, a document prepared independently from local authorities that exposes a summary of the city’s key trends since 2010 on each SDG. For example, it shows that if the city manages to fight unemployment effectively (SDG 8) and increase the level of education of its inhabitants (SDG 4), its performance in terms of increasing poverty rates is not as good (SDG 1) and the same goes for food insecurity (SDG 2). In terms of climate, despite decreasing energy intensity (SDG 7), efforts will have to be strengthened to achieve carbon neutrality. The report also highlights the lack of clarity on the carbon footprint of imported goods (SDG 13).

Sources: [City of Bristol](#), 2019; [Cabot Institute for the Environment](#), [University of Bristol](#).

The importance of local levels to achieve the SDGs is increasingly being recognised within international bodies. The *Report of the Secretary-General on SDG Progress 2019* already stated that “many local governments systematically took the initiative to implement SDGs, going further than national governments in some cases”. The report also advocates for capacity-building for local governments in its final recommendations (UNSG, 2019). A shared and highlighted remark in the political Declaration, adopted on the 25th September by the United Nations General Assembly during the SDG Summit, called to “enhance local action to accelerate the implementation of global objectives”.

Developing synergies between the 2030 Agenda and the Paris Agreement

The effects of climate change are without a doubt the biggest threat to reaching the objectives of the 2030 Agenda, as Liu Zhenmin, the Under-Secretary General of UN DESA, recently recalled ([UNA-UK](#), 19/06/2019). Potential action synergy for the 2030 Agenda and climate action on international, national, and local scales generated the mobilisation of diplomatic and academic communities. In 2019, the UN DESA, in partnership with IRENA, held the first-ever international conference on this subject in Copenhagen (1st-3rd April), bringing together practitioners, experts and decision-makers to formulate recommendations on the coherence of the two agendas.

At the end of 2018, the German Development Institute (DIE) and the Stockholm Environment Institute (SEI), also launched the NDC-SDG Connections, an initiative aiming to “reveal connection and synergy” between SDGs and NDCs (Nationally Determined Contributions submitted by member states to support the goals of the Paris Agreement), and therefore “identify potential entry points for more coherent policy-making and action.” ([DIE, SEI, 2019](#)).

In a note from December 2018 entitled “The Sustainable Development Goals viewed through a climate lens”, the NDC-SDG Connections team points out that contrary to synergy, rarely are potential trade-offs between SDGs or between NDCs and SDGs mentioned in international texts (SEI, 2018). However, there are sometimes obvious gaps between greenhouse gas emission reductions and development objectives: the substitution oil for biofuels encroaches on water resources and land used for food; the abolition of subsidies for vehicles emitting atmospheric pollutants, consistent with SDG 3 “Health and Well-being”, may collide with the ambition to reduce GHG emissions if it is done in favour of thermal vehicles, etc. Thus, it has been noted that halving air pollution in Beijing between 2009 and 2019 could paradoxically lead to a greater feeling of the effects of global warming, as polluting particles such as aerosols tend to cool the atmosphere (Fang & al., 2019).

These “set-backs” must not hide the many co-benefits that come out of the joint application of SDGs and the objectives of the Paris Agreement. The [SDG Climate Action Nexus tool](#) (SCAN-tool), identifies how climate action can have an impact on achieving the SDGs, and reveals that over three-quarters of identified links between the two agendas are positive. Keeping in mind that the synergies developed will, eventually, depend on local contexts, **the success of the 2030 Agenda and of the efforts against climate change are strongly interlinked** (Gonzalez-Zuñiga & al., 2018).

It is notably what comes out of the new digital climate simulation for 2100 presented on September 17th, 2019 by French scientists from the National Centre of Scientific Research (CNRS), the Alternative Energies and Atomic Energy Commission, and from Météo-France. Their analyses should feed the sixth assessment report of the Intergovernmental Panel on Climate Change (IPCC) planned for 2022. Their work predicts a global warming that will be “higher in 2100” than what precedent 2012 models had initially anticipated. Only one scenario, the most ambitious, would “only just” enable warming to remain under the 2°C objective in 2100. This implies “a bigger mitigation effort”. This implies “an immediate reduction in CO₂ emissions until reaching carbon neutrality on a global scale towards 2060, as well as capture of atmospheric CO₂ in the order of 10 to 15 billion tons per year in 2100”, the scientists explain. This last point is technically uncertain (see Climate Chance, 2018). The conditions for achieving this most optimistic scenario are based on strong international cooperation and a shared socio-economic pathway (SSP) known as “green-growth” (O’Neill & al., 2014) in line with reaching the SDGs.

The Observatory's approach

After extensive tracking and research, the Observatory selected 80 remarkable initiatives led by public local authorities, characterised by their innovation, inclusiveness, efficiency or replicability. No time for empty promises – only newly implemented or effective initiatives from 2018 and 2019 are put in the spotlight in this “World Tour”. The objective is **to illustrate concrete action led by local authorities and to identify international trends** within policy instruments and policies implemented by cities and regions worldwide. Using the SDGs opened the possibility of placing local initiatives in an overall coherence with local or multi-level public policies, by linking them to global issues.

Just as in 2018, **ten sectors of local public policies were studied**: urban planning, mobility, energy production and self-sufficiency, education and awareness, buildings and habitats, circular economy and waste management, food and agriculture, forests, decentralised cooperation and adaptation. Some initiatives and activities are very common: solar panels on school roofs, waste-to-energy systems, car-free days, environmental awareness and education campaigns, etc. This both indicates the trends in political choices made by local authorities as well as the potential for replicating these actions, for which there are now many models for communities to draw from. As a result, it

is also becoming easier to communicate on these types of actions and to disseminate feedback.

Based on the projects' descriptions, **the Observatory linked each initiative to corresponding SDG targets**. The reader will notice that some SDGs are only barely or even never associated with highlighted initiatives. For example, this is the case of SDG 5 "Gender Equality" and SDG 16 "Peace, Justice and Strong Institutions". Essentially focusing on violence, discrimination and opportunity equality, the six targets of SDG 5 on gender, do not methodologically offer much potential for connections with local climate action. This does not mean that gender and climate are two hermetic issues, quite the contrary; the increased vulnerability of women to the socio-economic impacts of climate change is very often highlighted in adaptation work. The social functions of subsistence and transmission that they perform in some local communities are crucial to understand in order to build responses entirely adapted to local contexts. **Gender equality is in fact, like climate, a transversal matrix to the SDGs**, which is directly mentioned or implied in intermediate targets calling for inclusiveness or universal access to a service. In practice, however, little attention is paid to gender issues in the NDCs reported by States. Thus, according to the NDC-SDG Connections, only 1% of overall climate activities in the NDCs mention gender, making SDG 5 the third SDG with the lowest number of activities in the NDCs (86), behind the objectives of the SDG 10 "Reduced Inequality" (30) and SDG 16 (12). In contrast to this trend, our census focused on valuing the role of women and vulnerable populations in general when it was evident, such as for the rural energy cooperative in Georgia or the AGRUPAR programme in Quito; similarly, the lack of apparent links between targets of SDG 16 does not prevent institutional consolidation or innovation efforts, such as the development of ecological kitchens in Imbabura, from being highlighted.

In contrast, the SDG 11 "Sustainable cities and communities" is omnipresent. As the foundation for local planning efforts, target 11.3, which aims to "strengthen inclusive and sustainable urbanisation for all and participatory planning and management capacities" by 2030, is therefore particularly prominent when looking at local action. Finally, the ambition of universality of the NDCs, which are addressed to both developed and developing countries, leaves aside certain issues that may be considered secondary to more fundamental development objectives. In addition, SDG 2 "Zero Hunger" and SDG 3 "Health and Well-being" never mention issues such as obesity and pesticides use. These issues can be perceived by some actors as the risk of an "ill-development", that should be avoided by some countries, and faced by others, not necessarily corresponding to the distinction between developing and developed countries.

Acknowledging these limits, the Observatory hopes, through this "Around the World in 80 Initiatives", to shed light on the connections that exist between local actions of mitigation and adaptation to climate change and international development objectives.

AROUND THE WORLD IN 80 INITIATIVES



URBAN PLANNING



ENERGY



WASTE



BUILDING



FOREST



FOOD



TRANSPORT



ADAPTATION



AWARENESS



DECENTRALIZED
COOPERATION

URBAN PLANNING

CANADA

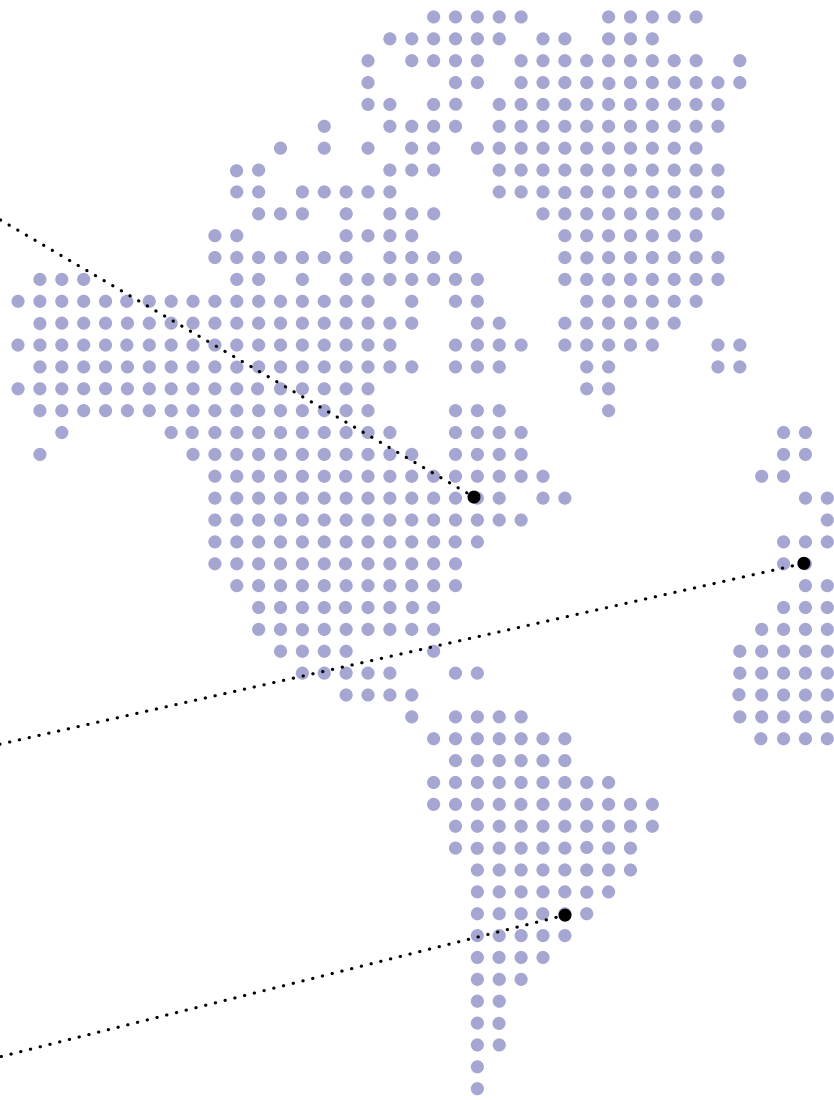
*Montreal •
Ruelles vertes
• Green alleys
facilitate
public space
appropriation*

SPAIN

*Sevilla •
'CartujaQanat' •
Urban
regeneration
operation*

ARGENTINA

*Buenos Aires
• Integrative
resilience building*





RWANDA
Kigali •
Restoring urban
wetlands

VIETNAM
Can Tho •
Linking
infrastructure
and environment

PHILLIPINES:
Metro Manila •
Rehabilitating the
Pasig River

MAURITIUS
Port-Louis •
Striving towards
a green port city

JORDAN
Jerash •
Retrieving
rainwater to
sustain a public
urban park



URBAN PLANNING

SPAIN

Sevilla • 'CartujaQanat' • Urban regeneration operation

The CartujaQanat programme addresses urban adaptation through a systemic approach to climate change. To encourage the expansion of this approach and to facilitate the financing of projects in other neighbourhoods, the city combines public and private governance. This urban ecosystem is composed of refreshing facilities: a bioclimatic qanat (underground aqueduct), an underground gallery (zoco), and a bioclimatic amphitheatre. The management of the integral water cycle uses nature-based, artisanal, and ancestral solutions to help cool public spaces. These innovative solutions are currently being implemented, and introduce new business models that promote local craftsmanship and educational programmes for citizens and local actors.

SDG 11 (TARGET 11.3 & 11.4); SDG 4 (TARGET 4.7); SDG 6 (TARGET 6.6)

VIETNAM

Can Tho • Linking infrastructure and environment

Can Tho's Resilience Strategy outlines the processes initiated to protect the critical services provided by manmade and natural infrastructure. The city's urban planning seeks to create a well-connected, modern, flexible, diverse and resilient infrastructure system. In the 2018-2025 timeframe, Can Tho is developing a city-wide GIS (Geographic Information System) database to improve infrastructure planning and management in three key sectors: flood management, public transport connection, and social support system for flood response.

SDG 1 (TARGET 1.5); SDG 9 (TARGET 9.1); SDG 11 (TARGET 11.3)

JORDAN

Jerash • Retrieving rainwater to sustain a public urban park

In a water-stressed environment, a project geared towards the harvesting of rainwater (collected in roof tanks with a storing capacity of 100 m³) and the recuperation of grey water (from council buildings) to irrigate the Green Garden Concept was initiated by the Greater Jerash Municipality. The undertaking is deployed on 5,650 m² to collect as much water as possible during the wet season to irrigate during the dry season. Local professionals are accordingly trained on technologies and equipment for rainwater and greywater recovery. The initiative also serves as an educational opportunity, as awareness is spread around the sensitive topic of water usage: over-exploiting traditional wells causes ground salinization and biodiversity losses.

SDG 4 (TARGET 4.7); SDG 6 (TARGETS 6.1 & 6.4)

PHILLIPINES

Metro Manila • Rehabilitating the Pasig River

In the 1990s, the Pasig River was declared biologically dead: industrial and residential development generated 72,000 tonnes of plastic waste that flowed through the river yearly, and aquatic life had essentially disappeared. Rehabilitation efforts began in 2010 for the protection, restoration and sustainable management of the river. These efforts included the resettlements of 18,719 families and the dismantlement of encroaching private structures. 37,741 meters of environmental preservation areas were established, 22,000 kg of solid waste were diverted, and public education campaigns were put in place. By upkeeping such efforts, the river could be capable of sustaining biodiverse ecosystems and of becoming a source of recreation and livelihood by 2032.

SDG 6 (TARGET 6.6); SDG 15 (TARGET 15.1); SDG 12 (TARGETS 12.4 & 12.8)



MAURITIUS

Port-Louis • Striving towards a green port city

The Port-Louis Smart City urbanisation plan outlines the Mauritian strategy to protect the environment while fostering a good socio-political and economic climate for the city's 200,000 inhabitants. The Rs 52 billion (€1.3 billion) project aims to create sustainable and self-sufficient working, living, and leisure spaces, to promote connectivity and reduce congestion. The initiative helps modernise infrastructure, improve roads, create pedestrian zones (otherwise inexistent), and construct new residential units. Drinking water and energy consumption are controlled. To reduce road congestion by 40%, train stations are in renovation and a light rail system is being constructed. The project will also generate 12,000 jobs by 2020 and attract 60,000 yearly visitors.

SDG 9 (TARGET 9.1); SDG 11 (TARGETS 11.1, 11.2)

ARGENTINA

Buenos Aires • Integrative resilience building

Buenos Aires is prone to river and coastal flooding, heatwaves, and vector-based diseases. The city is addressing the reduction of inequalities and resilience building through an integrative approach. To cope with floodwaters, Buenos Aires is investing in urban drainage (surface drainage and holding reservoirs). Hydro-meteorological sensors have been installed to monitor real-time weather conditions, rainfall and pipe capacity. Prevention campaigns for the elderly to better handle heat waves have reached over 1,000 people. As per its Plan of Action on Climate Change, the city is currently relocating vulnerable populations until 2025, planting 54,000 trees by 2023, and tackles the mosquito threat using fumigation, ovitraps and aromatic plants.

SDG 1 (TARGET 1.5); SDG 3 (TARGET 3.3); SDG 11 (TARGET 11.5); SDG 13 (TARGET 13.1 & 13.3)

CANADA

Montreal • Ruelles vertes • Green alleys facilitate public space appropriation

Montreal residents can initiate green alley projects: these consist in greening strips of land by public roads as part of the 'Make Yourself at Home' neighbourhood programme. The programme supports local residents in their appropriation of public space, while enabling sustainable street planning and facilitating its implementation. Some alleys simply host common flowers and plants, others make use of geothermal energy to heat and cool buildings throughout the neighbourhood. The implementation guide, last updated in 2019, evolves with the projects it supports: 9 new projects have begun in 2019, all helping foster a sense of community, but also improve air quality, reduce the heat island effect, shift land use, and raise awareness.

SDG 11 (TARGETS 11.3, 11.6 & 11.7)

RWANDA

Kigali • Restoring urban wetlands

Wetlands constitute valuable green infrastructure providing a range of necessary economic and environmental services: they store and release water, enable flood control, improve water quality, recharge ground water, and provide wildlife habitat. Kigali's ongoing urbanisation induces wetland alteration and drainage, which calls for the restoration and creation of urban wetlands. The project is to increase the technical and institutional capacities of planners and decision makers to reduce the threats posed by human activity through better urban wetland planning, and thus to restore and conserve 134 ha of wetland ecosystems. Rehabilitating Kigali's wetlands will work towards climate change mitigation and promote carbon sequestration.

SDG 13 (TARGET 13.1); SDG 15 (TARGETS 15.1, 15.5 & 15.9)

ENERGY PRODUCTION & SELF-SUFFICIENCY

ICELAND

Flúðir (Municipality of Hrunamannahreppur)

• *Low-temperature geothermal energy*

SPAIN

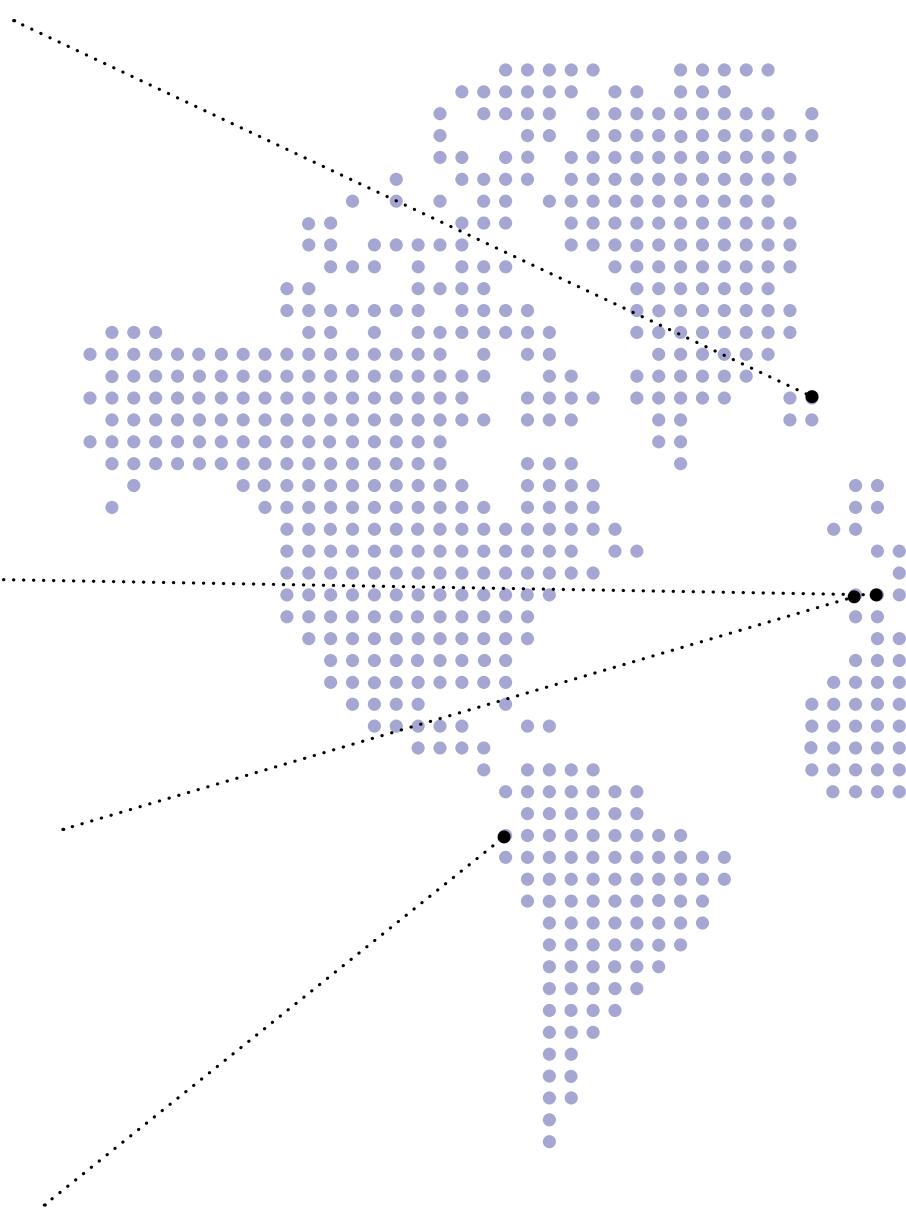
San Sebastián • Rethinking urban lifestyles to become carbon-neutral

PORTUGAL

Lisbon • ULisboa, a sustainable university campus

ECUADOR

Imbabura • Ecological kitchens as a rural energy efficiency strategy





GEORGIA
Gender-responsive energy cooperatives in rural Georgia

JORDAN
Amman • Green mosques to work towards zero-emissions

PHILIPPINES
Paluan (Mindoro) • 'Solar Para Sa Bayan' • Bringing electricity to rural areas

RWANDA
Muhanga • Showcasing solar-powered irrigation technology



ENERGY PRODUCTION & SELF-SUFFICIENCY

PORTUGAL

Lisbon • ULisboa, a sustainable university campus

10,000 photovoltaic panels have been installed by the University of Lisbon: roofs of buildings, car parks, and areas of leisure have been mobilised to implement the project. This is one of the largest renewable energy production initiatives in the city: the project has a capacity of over 2 MW, and yields a yearly production of 4.28 GWh – enough to power 1,600 Lisbon homes. Installing solar panels on the university campus also greatly reduces its footprint, as the alternative means of energy production enable an expected reduction of 12,106 tonnes of CO₂ emissions per year. The electricity produced is then sold and injected into the grid: the revenue of the project pertaining to the University of Lisbon is to be invested directly in on-site energy efficiency and consumption rationalization measures.

SDG 7 (TARGET 7.2)

SPAIN

San Sebastián • Rethinking urban lifestyles to become carbon-neutral

The ambition of San Sebastián is to decarbonate its energy sector by 80% by 2050 and to eliminate energy poverty. To this end, the city wishes to re-municipalise part of the energy services (production, distribution) through the creation of the municipal company Fomento de San Sebastián to strengthen the role of the climate and sustainability. The city guarantees renewable energy supplies for all municipal facilities and properties, and is also implementing rehabilitation programmes to regenerate buildings based on energy efficiency and decarbonised sources. Energy efficiency standards have been upgraded for trade, services, and restoration, as well as for companies, universities, and hospitals.

SDG 7 (TARGET 7.1)

ECUADOR

Imbabura • Ecological kitchens as a rural energy efficiency strategy

The Imbabura Province tailors political action to integrate marginalised indigenous communities. Rising pressure on natural resources, increasing land prices and water provision difficulties are managed through multi-level governance, fostering cooperation on effective climate change adaptation and energy efficiency. The government of Imbabura requires of 40% of its local governments to incorporate the topic of climate change in their development projects. Local and parochial governments are encouraged to directly invest in adaptation measures: 5 are investing US\$ 80,000 (complemented by a provincial contribution of US\$ 20,000) in the project “Implementation of ecological kitchens as a rural energy efficiency strategy and mitigation to climate change”.

SDG 1 (TARGETS 1.4 & 1.5); SDG 6 (TARGET 6.5); SDG 13 (TARGET 13.1 & 13.3); SDG 17 (TARGET 17.7)

JORDAN

Amman • Green mosques to work towards zero-emissions

Mosques in Amman are tiling their roofs with solar panels, bringing their carbon emissions close to zero. This shift towards renewable energies is based on the capitalisation on Jordan’s sunshine. Almost all mosques in Jordan are now 100% powered by renewable energies; with such success that some now even sell the surplus energy they produce to the national grid. Not only does engaging on the climate front fit within the country’s 2050 carbon neutral objective, preserving the environment through the protection of natural resources is also in line with Islam principles, as they warn against extravagance. Schools, most notably, are starting to follow suit – a critical initiative, as renewable energies are far from being the local norm.

SDG 7 (TARGET 7.2)

**ICELAND*****Flúðir (Municipality of Hrunamannahreppur) • Low-temperature geothermal energy***

Flúðir is becoming the first Icelandic community to produce locally its own low-temperature (120°C) geothermal electricity independently from the country's geothermal plants. Because it uses low-temperature water, the system operates at low-pressure levels (compared to traditional heat power solutions), which requires less energy for pumping, resulting in a higher net power output. The power generation system is made up of independent units that are easily adjustable to increase or decrease outputs. The production process decreases the water temperature without affecting its amount or quality. Disregarded until now because of Iceland's customarily low energy prices, this new and efficient technology only recently became economically feasible.

SDG 7 (TARGET 7.1); SDG 15 (TARGET 15.1)

PHILIPPINES***Paluan (Mindoro) • 'Solar Para Sa Bayan' • Bringing electricity to rural areas***

The municipality of Paluan no longer faces energy poverty, as it now has a solar-battery mini-grid ensuring 24/7 electricity, providing for the city's 16,000 inhabitants. The 6-megawatt microgrid uses a hybrid system of solar panels (provided by the first Filipino-owned solar panel manufacturer), batteries, and diesel backup generators. By collaborating with the company Solar Philippines, Paluan now provides power (for P9, or €0.16, per kWh) costing less than half of nationally-provided and subsidised electricity. The mini-grid fares well enough to consider providing electricity to neighbouring towns with the excess power supply. The initiative is encouraged by a presidential Executive Order to foster private investment in rural electrification.

SDG 1 (TARGET 1.4); SDG 7 (TARGET 7.1)

GEORGIA***Gender-responsive energy cooperatives in rural Georgia***

Gender-responsive energy cooperatives in rural Georgia are determined to provide access to affordable, locally-produced clean energy and to include women and men in sustainable business activities. The local cooperatives offer technical and financial advice for the production, installation, and dissemination of sustainable technologies that they have strived to make accessible by cooperating with two Georgian banks, granting affordable loans (priority is given to poor, rural, women-led households) paid back in 4 to 6 years. The local demand for solar solutions is high, energy efficiency has become accessible, and citizen participation has been strengthened through this replicable model of sustainable, gender-just energy cooperatives.

SDG 7 (TARGET 7.1);

RWANDA***Muhanga • Showcasing solar-powered irrigation technology***

Agriculture – employing 79% of the Rwandan population – greatly benefits from solar energy: unlike other irrigation practices, solar irrigation does not require daily inputs of fuel or electricity, making it an affordable and viable small-scale solution. Takwe, in the Muhanga District (represented by local officials, agronomists and cooperatives), served to showcase the technology: composed of a pump, solar panel, pipes and dam sheets, the installation has a capacity of 120 L3. The subsidised strategy (farmers only pay 30% of the cost) is to be expanded to 8 districts of southern Rwanda. Solar-powered irrigation will improve agricultural productivity, secure 13,000 smallholder farmers' livelihoods (half of them women), and increase food security.

SDG 7 (TARGETS 7.1 & 7.2); SDG 2 (TARGET 2.3)

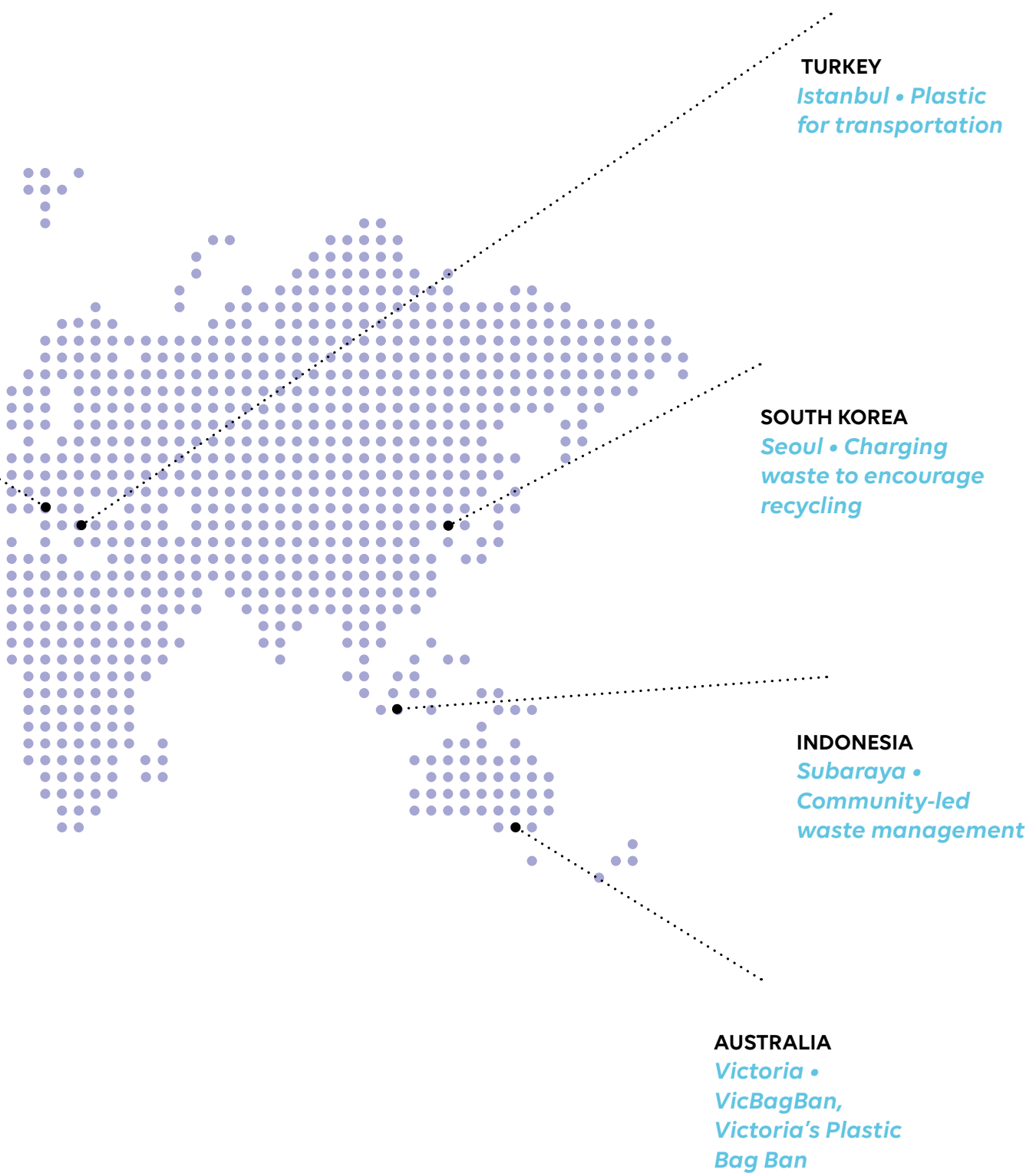
WASTE & CIRCULAR ECONOMY

BULGARIA
*Svilengrad • Door-to-door
collection system*

SPAIN
*Balearic Islands •
Ambitious waste
prevention policy*

SENEGAL
*Diamaguene
Sicap Mbao •
Biogas energy
recovery*

GHANA
*Accra •
Formalizing solid
waste collection*





WASTE & CIRCULAR ECONOMY

TURKEY

Istanbul • Plastic for transportation

In Istanbul, commuters can exchange their aluminium cans and plastic bottles for transport credit – an initiative bound to encourage recycling. The city's undertaking is all the more remarkable that sustainability is barely addressed in Turkish political discourses. The 3 vending machines in place in a number of metro stations throughout the city give a few cents of credit for each inserted bottle or can and crush, shred, and sort out the recyclable waste. The ambition is to place a total of 25 of these vending machines around town, including in schools and universities, to create long-term recycling habits. The credit accumulated on city transportation passes may be used to access metros, buses, trams, and even public restrooms.

SDG 11 (TARGET 11.2); SDG 12 (TARGET 12.5)

GHANA

Accra • Formalizing solid waste collection

The Accra Metropolitan Assembly is particularly prone to flash flooding. In the face of a constant population increase, the city urbanises rapidly, and citizens have to endure poor water, sanitation, and solid waste management. Accra is incorporating (through registration) all informal waste collectors into the contracts signed with waste disposal companies around the city to improve the coverage of trash collection. Large garbage collection trucks are unable to circulate through the narrow, poorly planned parts of town, which called for the complementation of the service by the integration of informal waste collectors. By doing so, the city increases climate resilience and makes a sustainable and efficient use of resources while recognising and valuing the informal sector.

SDG 8 (TARGET 8.3 & 8.8); SDG 11 (TARGET 11.6); SDG 12 (TARGET 12.2 & 12.5)

BULGARIA

Svilengrad • Door-to-door collection system

As the first municipality in Bulgaria officially committing to zero waste, the Svilengrad Municipality has introduced with Ecopack, a packaging recovery organization, a door-to-door collection system for dry recyclable waste, extended to 1,000 single-family households. Electronic waste is collected through a local network of collection points in local shops. As for multiple-family high-rise buildings, green eco-islands have been put in place for the residents. Similar eco-islands have also been created in all of the city's kindergartens to promote the early learning of the appropriate habits and attitudes to have towards waste through practical activities. Svilengrad's landfill was also closed to be covered it with trees.

SDG 4 (TARGET 4.7); SDG 11 (TARGET 11.6); SDG 12 (TARGET 12.5)

SPAIN

Balearic Islands • Ambitious waste prevention policy

The Balearic government, conceiving the circular economy as including recycling as much as waste prevention, voted a framework on waste prevention and plastics reduction – a measure much more ambitious than the current EU norms. The Waste and Polluted Soils Law imposes binding reduction targets for the generated waste: the islands are to reduce waste by 10% in 2021 and 20% by 2030 (2010 baseline). Single-use and non-rechargeable items, mostly made from plastic (or containing microplastics and nanoplastics), are now banned. To foster reusable packaging, water fountains have been installed and public procurements include waste prevention criteria. The law also targets food waste, electronic waste, textile and furniture, urging citizens to reuse materials.

SDG 11 (TARGET 11.6); SDG 12 (TARGETS 12.3 & 12.5); SDG 14 (TARGET 14.1)



SENEGAL

Diamaguene Sicap Mbao • Biogas energy recovery

The municipality of Diamaguene Sicap Mbao is committed to the methanisation of its waste and the production of biogas. The presence of the country's greatest livestock market in Diamaguene, holding more than 3,000 bovines every day, created a "waste to energy" opportunity, mostly based on the use of the enormous daily on-site production of cow dung. The biogas produced is intended for bottling, but the project extends to the development of the livestock market and to formalisation of a sound framework for the diversity of its economic and social activities (which includes officialising clandestine slaughterhouses).

SDG 2 (TARGET 2.4); SDG 11 (TARGET 11.6); SDG 12 (TARGET 12.5)

INDONESIA

Subaraya • Community-led waste management

It took a decade for Subaraya to face its systemic waste problem through innovative and sustainable waste management. The city introduced organic composting to over 20,000 households, following the model of Kitakyushu (Japan), its Green Sister City: waste was reduced by 30%. Urban farming is encouraged, and wastewater treatment has largely improved. The city's management system relies on waste selection and separation – plastics are given priority – for waste banks (whose profits go towards greening initiatives) to function. Environmental Facilitators, trained by the city government, facilitate environmental activities in their communities, especially on solid waste management. The Index of the Quality of the Environment and Waste has been steadily improving.

SDG 6 (TARGET 6.3); SDG 11 (TARGETS 11.3 & 11.6); SDG 12 (TARGETS 12.3 & 12.5)

SOUTH KOREA

Seoul • Charging waste to encourage recycling

South Korea has largely increased its food waste recycling: from 2% in 1995 to 95% today. Seoul is engaging in waste recovery by ensuring all food waste eventually becomes a resource such as animal feed, fertilizer, biogas or bio-oil, reducing daily food waste by 400 metric tonnes. A pay-as-you-waste scheme, combining priced biodegradable bags and automated scaling bins, has reduced Seoul's food waste by 47,000 tonnes in 6 years. The city government is linking the reduction of food waste to the local urban farming movement, and providing 80 to 100% of the start-up costs of urban farms and community gardens which have increased six-fold in 7 years, now covering 170 hectares in between city blocks or on top of schools and municipal buildings.

SDG 2 (TARGET 2.4); SDG 11 (TARGETS 11.3 & 11.6); SDG 12 (TARGETS 12.3 & 12.5);

AUSTRALIA

Victoria • VicBagBan, Victoria's Plastic Bag Ban

The Australian state of Victoria is introducing a plastic bag ban to come into effect on November 1st, 2019. The ban targets lightweight plastic shopping bags that have a thickness below 36 microns made from all types of plastic, including degradable, biodegradable, and compostable plastics. The ban applies to all suppliers and retailers, may they be supermarkets, green grocers, bakeries, pharmacies, clothing stores, restaurants, cafes, markets, or takeaway food outlets. Engaged by the Department of Environment, Land, Water and Planning, the National Retail Association is making use of 2019 to support retailers adapting to the changes required by the ban, in the hope of minimising its impact on Victorian businesses and ensuring a smooth transition.

SDG 12 (TARGET 12.5 & 12.6)

BUILDINGS & HABITAT

UNITED STATES

*Cambridge (MA) •
From a 19th century
building to a solar-
energy shelter*

SPAIN

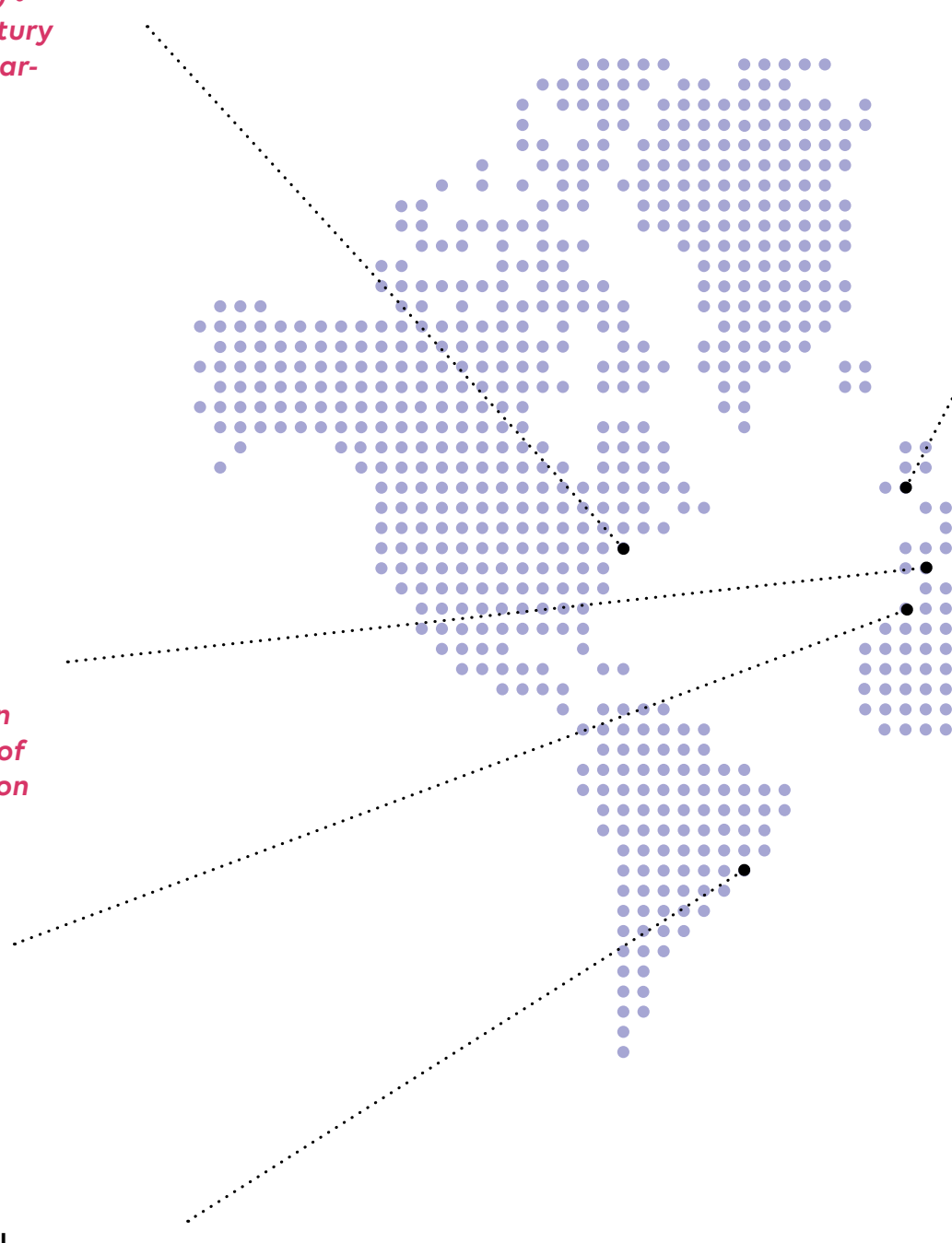
*Málaga •
Bioclimatic
strategies in
the service of
rehabilitation*

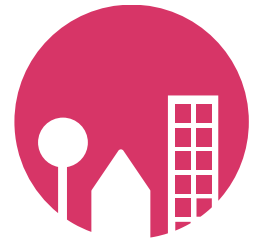
MOROCCO

*Marrakesh •
A sustainable
semi-Olympic
swimming
pool*

BRAZIL

*Refresca São Paulo • Favela-scaled
fight against climate change in
the form of a community system of
rainwater collection*





UNITED KINGDOM
Wales • Warm Homes Programme

SWEDEN
Malmö • 'Greenhouse Augustenborg' • Adding new urban space and qualities to existing neighbourhoods

NETHERLANDS
Amsterdam • RESILIO • Climate-adaptive roofs

TURKEY
Eskişehir • Energy-efficient buildings



BRAZIL

Refresca São Paulo • Favela-scaled fight against climate change in the form of a community system of rainwater collection

Favelas are particularly vulnerable to rising temperatures and changing rain patterns. The CAJU Initiative's project, Refresca São Paulo, improves the resilience of favelas by counteracting the aggravated heat island effect and worsened provision of water. Community systems of rainwater collection based on local precipitation patterns are put in place to ensure water supply and irrigation all year round. Vertical gardens made of recyclable materials and fruit vines are introduced to green slums, encourage urban agriculture, contribute to the community's food security and livelihood, and to green-insulate accommodations. These measurable, replicable, and accessible design strategies help vulnerable communities adapt to climate change.

SDG 1 (TARGET 1.5); SDG 2 (TARGET 2.1); SDG 6 (TARGET 6.4); SDG 11 (TARGET 11.1); SDG 12 (TARGET 12.2); SDG 13 (TARGET 13.1)

UNITED STATES

Cambridge (MA) • From a 19th century building to a solar-energy shelter

The city of Cambridge (Massachusetts) partnered with local architects to renovate an 1885 building, transforming it into a safe, short-term, sustainable housing solution for those in need, while preserving the site's historical character. This mixed-use community centre – which can accommodate up to 10 families at a time – is designed to minimise its energy use, and to provide the incompressible: 43.8% of the energy is created on site. Double-thickness walls and energy-efficient windows and doors ensure insulation (including from the subway's noise pollution), 3 types of solar roof tiles were used, maximum-efficiency mechanical systems were put in place, thermal collectors heat running water, and sensory LED lighting is consistently used.

SDG 7 (TARGET 7.3); SDG 11 (TARGET 11.1 & 11.4)

TURKEY

Eskişehir • Energy-efficient buildings

The Eskişehir Metropolitan Municipality is involved in public-private partnerships of businesses, NGOs, and research organisations assisting the local government to improve building efficiency. The city engages through greener municipal buildings (extra 30 to 60% of energy savings than national regulation requirements), energy audits (to strategically target retrofits), and an interweaving of green spaces and efficient transport networks to create a more liveable and resilient urban area. These efforts are complemented by job trainings and workshops for architects, engineers, or municipal technical staff, and by public awareness-raising (via TV spots, billboards, websites, and a youth festival featuring energy-efficiency themed games).

SDG 7 (TARGET 7.3); SDG 4 (TARGET 4.7); SDG 11 (TARGET 11.2); SDG 17 (TARGET 17.7); SDG 13 (TARGET 13.3)

SWEDEN

Malmö • 'Greenhouse Augustenborg' • Adding new urban space and qualities to existing neighbourhoods

Greenhouse Augustenborg is a renovation project that aims to improve the living conditions of the inhabitants while curbing the phenomenon of gentrification and allowing the current population to stay in the neighbourhood. This project has been implemented to green the district, to add new urban spaces accessible to locals, and to optimise and value the current buildings' features (such as optimal sunlight conditions). Domestic greenhouses on roofs and large balconies are an innovative component of this sustainable social housing project, as they help reduce the ecological footprint of food production while allowing residents to heat their "passive" homes by using heat from sunlight and household appliances.

SDG 7 (TARGET 7.3); SDG 11 (TARGET 11.1 & 11.3 & 11.7)



SPAIN

Málaga • Bioclimatic strategies in the service of rehabilitation

In Málaga, the industrial textile complex of Intelhorce has been rehabilitated to improve energy efficiency and reduce CO₂ emissions, while recovering the existing structure and adapting it to its new use: the logistics centre of Mayoral Children's Clothing company. The new façade of the building is made out of the largest glassfiber reinforced concrete (GRC) panels manufactured in Spain, folded to achieve viability: the fabric-looking design, based on the scale, shape, and geometry of the existing structure, reduces solar radiation by 39%. The building was renovated using recycled materials from the demolition of the various buildings of the complex, and has implemented bioclimatic strategies based on microclimate simulations to reduce ground-level temperatures.

SDG 7 (TARGET 7.3); SDG 9 (TARGET 9.4); SDG 12 (TARGETS 12.5 & 12.7)

NETHERLANDS

Amsterdam • RESILIO • Climate-adaptive roofs

Amsterdam is implementing the 2018-2021 RESILIO scheme: Resilience nEtnetwork of Smart Innovative cLimate-adaptive rOoftops, an adaptive urban water management solution. 10,000 m² of smart blue green roofs are being built, with at least 8,000 m² on social housing rooftops. These roofs store extra water under a layer of plants. The blue-green features act as a buffer for houses by improving insulation, are an efficient cooling mechanism in the face of heat islands, and promote biodiversity. The roofs, connected in a network, have a "smart flow control" system (based on water management settings and weather forecasts) that anticipates heavy rain or drought and releases or retains water accordingly, thus upkeeping the rooftops' layer of plants.

SDG 7 (TARGET 7.3); SDG 6 (TARGET 6.3); SDG 15 (TARGET 15.9)

UNITED KINGDOM

Wales • Warm Homes Programme

Wales' Warm Homes Programme (which includes Arbed and Nest) strives to improve energy efficiency of low-income homes in a region where 23% of the population lives in fuel poverty. Often located in the most deprived areas of Wales, 45,000 of these homes have been retrofitted, and 105,000 advised, creating 500 jobs in the process, and reducing by more than 2,540 tonnes CO₂ emissions. Not only does the programme aim to eradicate fuel poverty (through energy efficiency improvements), it also hopes to mitigate climate change, foster job growth, and engage with communities and schools. The Welsh Government evaluates the potential for maximum impact, and either targets areas in energy poverty (Arbed) or supports the reduction of energy bills (Nest).

SDG 4 (TARGETS 4.7); SDG 7 (TARGETS 7.1 & 7.3); SDG 13 (TARGET 13.2); SDG 8 (TARGET 8.5)

MOROCCO

Marrakesh • A sustainable semi-Olympic swimming pool

The regional direction of the Ministry of Youth and Sports coordinated the construction of a covered semi-Olympic swimming pool upholding international swimming standards and sustainability principles in the Sidi Youssef Ben Ali district. Timber reduces the use of concrete for reinforced columns, the roof and external walls were insulated, PAC heat pumps and 12 solar panels ensure hot water production (and reduce energy consumption by 30%), electric lighting use is reduced and LED lighting consistently used, showerheads and sinks have been designed to reduce water consumption, and the treatment and disinfection of the pool uses ultraviolet treatment and sand filtering. The building's overall greenhouse gas emissions amount to 5.48 kgCO₂/m²/year (traditional pools emit on average 6.25 kgCO₂/m²/year).

SDG 7 (TARGET 7.3); SDG 11 (TARGET 11.3); SDG 12 (TARGET 12.2)

FORESTS





LEBANON

*District of Bint Jbeil
• Reforestation and
preservation of remaining
forest for its role regarding
water*

INDONESIA

*Sungai Nibung • A
moratorium dedicated to
mangrove and livelihood
recovery*

AUSTRALIA

*Melbourne • The
Urban Forest Fund
• Greening Howlett
Street*

ALBANIA

*Tirana • An orbital
forest to balance
nature and city*



FORESTS

AUSTRALIA

Melbourne • The Urban Forest Fund • Greening Howlett Street

Private property represents 73% of the land in Melbourne, which offers a great potential for private greening initiatives. The Urban Forest Fund gives grants to projects accelerating the city's greening and involving all metropolitan Melbourne, debuting in 2017 with \$200,000 allocated to the Greening Howlett Street project. The 45-apartment complex is undertaking a greening project in its outdoor common area involving 1,653 new (often edible) plants in 122m² of vegetation, custom deep planter boxes, a shaded courtyard, a green wall, a tract-roof terrace, a bamboo forest entrance, and a new storm water harvesting and irrigation system. This urban oasis is designed to help promote biodiversity, prevent the heat island effect and mitigate flooding.

SDG 6 (TARGET 6.4); SDG 13 (TARGET 13.1); SDG 11 (TARGET 11.3); SDG 15 (TARGET 15.9)

ALBANIA

Tirana • An orbital forest to balance nature and city

The "Tirana 2030" General Local Plan was outlined to prevent urban sprawl through the planting of an urban orbital forest of 3 million trees. The two green rings in central Tirana foster cycling and walking, and are backed by the organization of car-free days, the construction of bike lanes, and the launch of a dock-less bike sharing system, paving the way for better air quality. In addition to these two rings, an oasis around Lake Farka and to green corridors along rivers, green space is set to triplicate in the city, striking a balance between natural and urban infrastructure.

SDG 3 (TARGET 3.9); SDG 9 (TARGET 9.1); SDG 11 (TARGETS 11.2, 11.3 & 11.6)

INDONESIA

Sungai Nibung • A moratorium dedicated to mangrove and livelihood recovery

Years of environmentally dangerous practices (from bombing and poisoning catches to converting inland tree cover into plantations) have compromised fish stock and reduced incomes. The village government of Sungai Nibung passed a moratorium for the recovery of its mangrove. Several tributaries of the river are closed to any form of exploitation, and a patrol established by the local government monitors and enforces the moratorium. The moratorium is based on natural rhythms to define harvest seasons, which has greatly helped the recovery: increases in catch volume, weight of individuals, and incomes (+70% in 2nd phase compared with pre-moratorium baseline) have been observed. Violators of the moratorium face fines of 1,000 ketupat and social censure.

SDG 14 (TARGET 14.4 & 14.5); SDG 15 (TARGETS 15.2)

LEBANON

District of Bint Jbeil • Reforestation and preservation of remaining forest for its role regarding water

Bint Jbeil District's naturally sparse canopy surface is strongly affected by human misuse and the effects of climate change, which cause higher temperatures and less rainfall. This results in population fragmentation, pest outbreaks, and more wildfires, which in turn threaten the tree cover due to the forest's reduced capacity to collect and store water. To combat these threats, Bint Jbeil is increasing the district's green cover through the reforestation and afforestation of roadside plantations, and the replantation of conservation areas. Wildfire prevention and control is ensured all year round, and free distributions of trees foster plantation while raising awareness. The project has, since 2005, enabled an increase of 55 ha of green cover.

SDG 15 (TARGETS 15.1 & 15.2); SDG 13 (TARGET 13.1)



UNITED STATES

Baltimore (Maryland) • TreeBaltimore • Valuing the ecosystem services of street trees

TreeBaltimore is a mayoral initiative that aims to increase the city's tree canopy from 27.4% to 40% by 2037. Baltimore's street tree population is composed of 100,000 trees – one for every six residents – of 95 different species. The trees provide a number of services that have been evaluated by the city to stress the value of its inner forest: in its lifetime, a tree provides an estimated €52 000 of overall economic and environmental services provided through shading and wind blocking (resulting in energy savings), carbon storage (reducing the greenhouse effect), and removal of air pollution and ozone. Trees also reduce rain-water runoff and erosion, which improves water quality, and provide wildlife habitats otherwise absent from urban landscapes.

SDG 3 (TARGET 3.9); SDG 6 (TARGET 6.3); SDG 11 (TARGET 11.6); SDG 15 (TARGETS 15.1 & 15.2)

TUNISIA

Tunis • inauguration of an urban forest

An urban forest of 3 hectares was inaugurated in the El Agba neighbourhood of Tunis. The intention is to keep the area a preserved forest rather than transform it into a park (and its host of restaurants, cafes, and shops), which is why a single point of sale exists on the forest grounds: in an effort to bolster the circular economy and the participative approach, it is reserved for local products made by rural women. A wellness trail with wooden infrastructure expected to benefit 30,000 people was also created, and 30 solar spotlights are being set up. Costing 200,000 Tunisian dinars (€60,000), the urban forest will improve Tunis' resilience and water quality by preventing erosion, limiting evapotranspiration, and filtering pollutants.

SDG 3 (TARGET 3.9); SDG 6 (TARGET 6.3); SDG 11 (TARGETS 11.3, 11.6 & 11.7); SDG 15 (TARGET 15.2)

GUATEMALA

Concepción Chiquirichapa • Relying on Mayan knowledge for forest restoration

Concepción Chiquirichapa's 18,000 inhabitants are relying on the community's ancestral Mayan knowledge to restore the sacred forest and its water supply, and preserve their livelihoods. The forest can be a source of food, natural medicine, and leaf litter (fertiliser) as long as its use is sustainable. The municipal Department of Protected Areas has gathered socio-forestry trainers to education locals on environmental issues, and installed a meteorological centre to measure the local effects of climate change to help shift policies towards resilience. The municipality has also offered training in soil conservation and crop diversification, while re-teaching local medicinal plants' characteristics to help people reconnect with their culture.

SDG 4 (TARGET 4.7); SDG 11 (TARGET 11.4); SDG 13 (TARGET 13.1); SDG 15 (TARGET 15.3)

UNITED KINGDOM

London • The world's first National Park City

On July 22nd, 2019, London officially became the first city in the world to become a national park thanks to the many green spaces it contains. 47% of the city is already covered in parks, gardens, and woodlands, but this accreditation strives to make London greener, healthier, and wilder. While the mayor announced commitments to the protection and enhancement of the city's green belt, green spaces, and canopy, citizens were the first to mobilize. The initiative was launched with a Universal Charter (as requested by several world leaders) and the National Park City Festival (from July 20th to 28th, 2019) which comprised 300 free outdoor events.

SDG 11 (TARGETS 11.3 & 11.7)

FOOD & AGRICULTURE

FRANCE

Pantin • A rooftop urban farm feeding schools and providing local markets

UNITED STATES

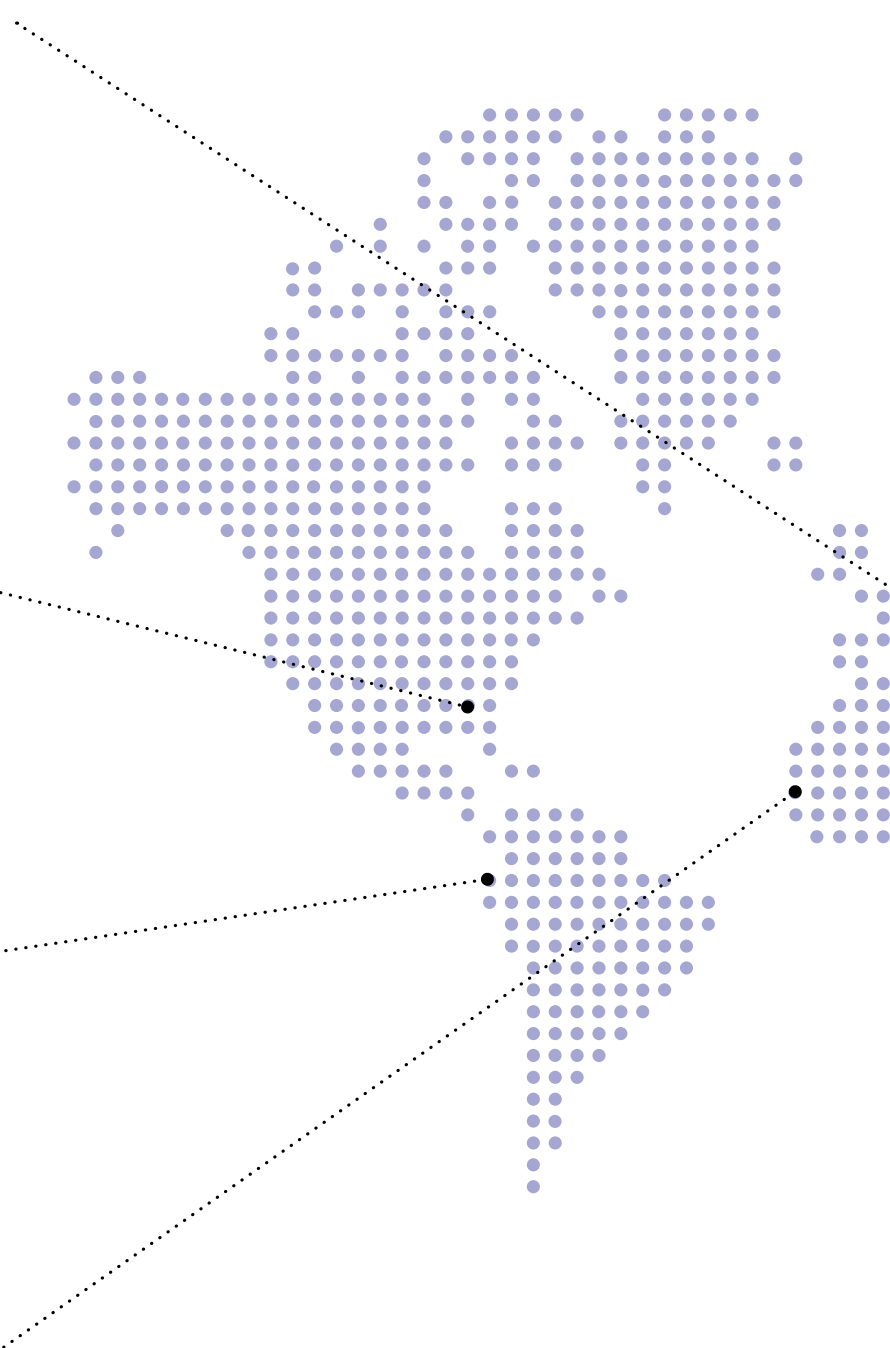
Atlanta (Georgia) • Urban Food Forest at Browns Mill

ECUADOR

*Quito • AGRUPAR
A Participatory Urban Agriculture Project*

SENEGAL

Dakar • Fighting against poverty through micro gardening





ITALY

*Milan • OpenAgri •
Open Innovation Hub on Peri-Urban
Agriculture*

INDIA

*Madhya Pradesh •
Mainstreaming adaptation
into the livestock sector*

FRANCE

*Mafate (La Réunion) •
Recovering agriculture
practices, culinary
traditions, and know-how
to revitalise the territory*

MOZAMBIQUE

*Quelimane • Organic production
from market waste*



FOOD & AGRICULTURE

FRANCE

Pantin • A rooftop urban farm feeding schools and providing local markets

To promote urban agriculture in Paris and its surroundings, Pantin is remodelling its municipal technical centre's 2,400 m² roof to host 800 columns supplied in water and organic matter. Starting in 2019, the columns are expected to produce approximately 65,000 kg of about 50 varieties of fruits, vegetables, and aromatic herbs yearly. Costing an estimated €200,000, this vertical aeroponics innovation (a form of soil-less cultivation) guarantees efficiency in food production and isolation from polluted air and soils. The city is planning on dedicating the substantial amounts of short-circuit, quality food produced to school canteens and local markets, hoping to foster social ties and to contribute significantly to people's food supply.

SDG 2 (TARGET 2.4); SDG 11 (TARGET 11.3); SDG 12 (TARGET 12.7)

ITALY

Milan • OpenAgri • Open Innovation Hub on Peri-Urban Agriculture

To make urban food systems more inclusive, resilient, safe, and diverse, as outlined in the Municipality of Milan's Food Policy objectives, the city created OpenAgri: an Open Innovation Hub on Peri-Urban Agriculture. OpenAgri concentrates innovative solutions aimed at regenerating an affected peri-urban zone of the city by making it an example of social inclusion and innovation. This living lab, working to reduce the environmental impacts of farming, also serves as an artistic residence and for job shadowing arrangements, promoting jobs and skills creation, and open innovation along the food supply chain (production, processing, distribution, consumption, waste management) while increasing the city's resilience and sustainability.

SDG 11 (TARGETS 11.3 & 11.A)

MOZAMBIQUE

Quelimane • Organic production from market waste

Quelimane's growing population, calling for greater food production, caused a devastation of mangrove areas and an increase in markets' food waste. The municipality launched the "Quelimane Limpa" project: a systemic integration of food waste, collected from markets and transported to a locally-managed compost-making facility. Compost is then distributed to hundreds of gardens around the city, increasing yields and preserving the soil structure – this translates into increased household productions, and tackles malnutrition. Restoring agricultural productivity also buffers climate-change induced frequent flooding, as the city put a halt to over-cultivation, which was the cause of the degradation of the protective coastal vegetation and soils.

SDG 2 (TARGETS 2.2 & 2.4); SDG 11 (TARGET 11.3); SDG 12 (TARGET 12.3); SDG 13 (TARGET 13.1); SDG 15 (TARGET 15.3)

FRANCE

Mafate (La Réunion) • Recovering agriculture practices, culinary traditions, and know-how to revitalise the territory

With the emergence of tourism, agriculture has largely been neglected in Mafate since the 1980s. Because the region is very isolated, Mafate long relied on its inventive and adaptive agriculture, but the 100,000 yearly tourists put a strain on food production. Increasing imports to meet demand have led locals to feed mainly on low-quality, imported products: a tailored territorial food project (focused on agriculture, nutrition, health and the environment) has been put in place to counter poor diets. The focus is on re-anchoring the food supply in Mafate, through a revitalisation of local, short-circuit agriculture and culinary traditions (benefitting tourists when possible), integrating of the agricultural economy in the tourism economy.

SDG 2 (TARGET 2.4); SDG 8 (TARGET 8.9); SDG 12 (TARGET 12.7)

**INDIA****Madhya Pradesh • Mainstreaming adaptation into the livestock sector**

The state of Madhya Pradesh is vulnerable to extreme heat and irregular rain patterns, exacerbated by climate change: this has a toll on agriculture, the population's main livelihood. To contend with climate risks, the Department of Animal Husbandry incorporates climate-risk considerations into its programmes and budget. It focuses on phasing out exotic cow breeds and promoting indigenous species, and invests in climate-resilient breeding programmes. The programmes, encouraging cattle ownership, identify high-yielding indigenous cattle with high reproductive value and resilience to diseases and heat. Veterinarians are mobilised, and attention is given to improved fodder quality and availability (harshly affected by droughts and dry periods).

SDG 1 (TARGET 1.4 & 1.5); SDG 2 (TARGET 2.4); SDG 13 (TARGET 13.1)

ECUADOR**Quito • AGRUPAR • A Participatory Urban Agriculture Project**

Quito launched the AGRUPAR Programme after an economic crisis that put 48% of the population below the poverty line. This locally-financed project enhances food security, improves livelihoods, fosters job creation and democratises food systems. It supports agricultural micro-practices and organic certification, and has a visible impact: over 3,000 urban gardens were created (acting as carbon sinks), 20,000 people received technical agricultural training, benefitting over 400,000 citizens with 960,000 kg of food produced yearly. The project – enabling low-cost water harvesting and flood mitigation measures – constantly expands its scope to include vulnerable groups such as women (representing 84% of participants), the elderly and migrants.

SDG 1 (TARGETS 1.1, 1.2, 1.4); SDG 2 (TARGETS 2.1, 2.2, 2.3, 2.4); SDG 8 (TARGET 8.3); SDG 10 (TARGET 10.2); SDG 11 (TARGET 11.3); SDG 13 (TARGET 13.1)

SENEGAL**Dakar • Fighting against poverty through micro gardening**

Dakar's growing population largely decreased the city's cultivated areas and water availability, thus increasing health and nutrition vulnerabilities. Micro-gardening is a sustainable alternative to face poverty and food insecurity, as micro-gardens are small, inexpensive production units suited to dense urban neighbourhoods. The municipality is invested in these green lungs: 12 training and demonstration centres were installed, and 24 micro-gardeners were educated to train others, to reach a total of 9,694 beneficiaries (83% women). The initiative requires little investment because it uses recycled material and local products, becomes a source of income and of complete and healthy diets, as the yields are mostly higher and of superior quality.

SDG 1 (TARGETS 1.1 & 1.2); SDG 2 (TARGETS 2.1 & 2.4); SDG 11 (TARGET 11.3); SDG 12 (TARGET 12.5)

UNITED STATES**Atlanta (Georgia) • Urban Food Forest at Browns Mill**

With a third of the population living below the national poverty line, 36% of Atlanta was categorised as a food desert – a low-income area lacking access to fresh, whole foods. In an effort to ensure access to fresh food within a half-mile of 85% of Atlanta residents by 2021, the city council voted to purchase a 7.1-acre food forest, the largest in the US. The investment allows the community to preserve and use culturally and historically significant land and to improve food security: 1,000 types of fresh fruit, vegetables, herbs and nuts are grown using agroforestry, and beehives and mushroom beds provide educational opportunities. This free public community garden mimics natural woodlands to grow food on 7 productive layers, from the canopy to the root zone.

SDG 1 (TARGETS 1.1 & 1.2); SDG 2 (TARGET 2.4); SDG 11 (TARGETS 11.3, 11.4 & 11.A); SDG 15 (TARGET 15.3)

MOBILITY

FRANCE

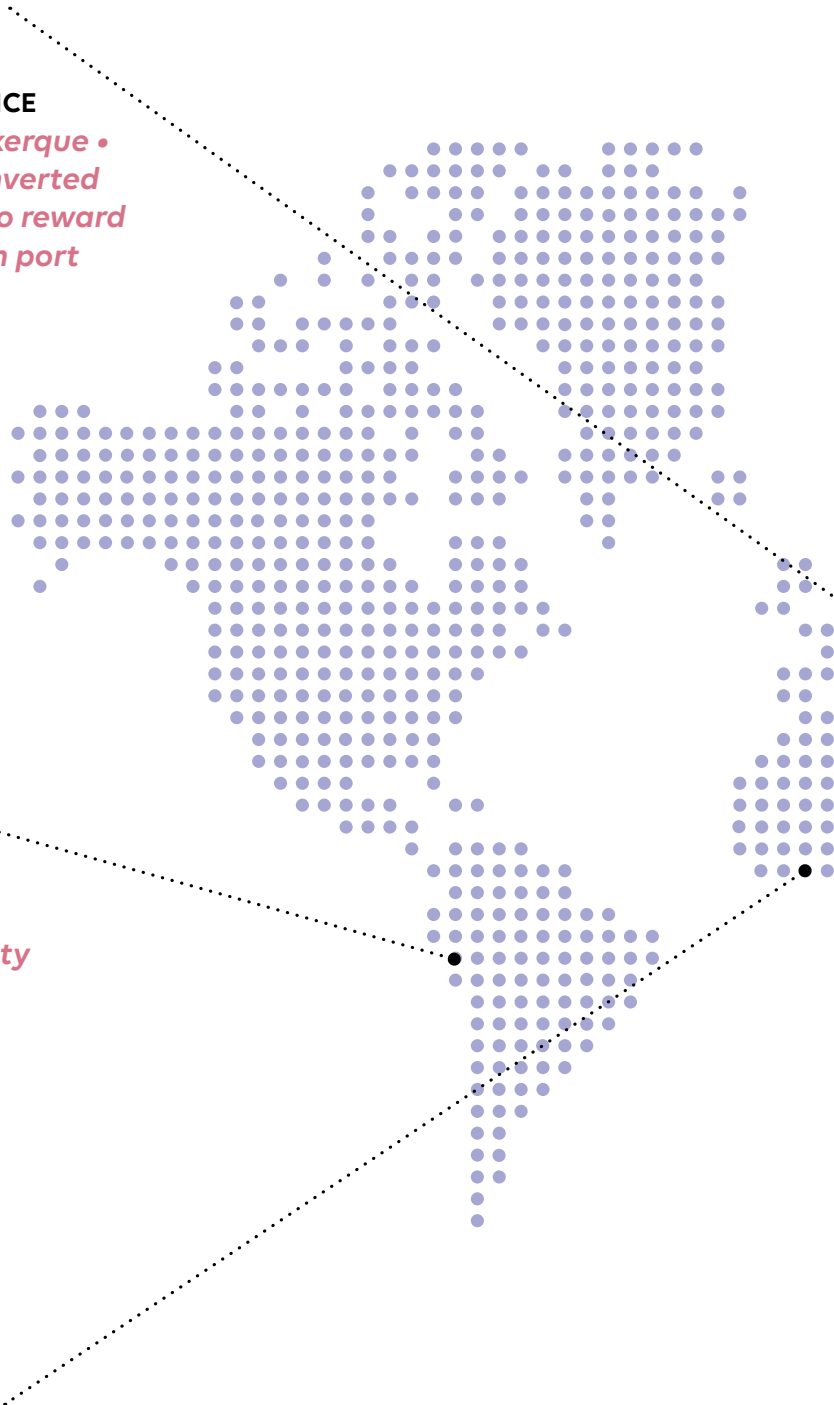
Dunkerque • An inverted toll to reward clean port calls

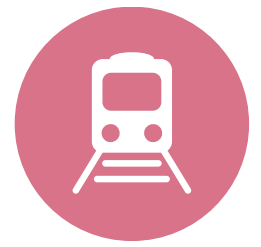
PERU

Lima • Car-free days in historic city centre

IVORY COAST

Abidjan • A multi-actor cooperation for a bicycle sharing system





POLAND

Ostrów Wielkopolski • Integrated approach to public transportation

JAPAN

Yokohama • Shifting towards hydrogen modes of transport to reinforce the city's resilience

PAKISTAN

Karachi • A zero-emissions Bus Rapid Transit system

INDIA

Bhopal • Fully-automated bike sharing system with dedicated lanes

TUNISIA

Tunis • Light rail to reduce congestion



PAKISTAN

Karachi • A zero-emissions Bus Rapid Transit system

Karachi approved in October 2018 a 30-kilometer Bus Rapid Transit (BRT) system operated by a biomethane hybrid bus fleet on segregated lanes, with a large CO₂ reduction potential, implemented in 4 years and viable for 20. This safe and accessible mode of transport is designed to reduce traffic congestion and air and noise pollution, replacing the failing old and poorly maintained public transport system to blame for the rise of private vehicle ownership and paratransit modes, which in turn have worsened congestion in trying to reduce commuting times. The project extends to the flood-proofing of roads, the creation of a biogas plant covering 100% of the BRT system fuel demand, and last-mile connectivity is optimised via bikes and rickshaws.

SDG 7 (TARGET 7.1); SDG 9 (TARGET 9.1)

JAPAN

Yokohama • Shifting towards hydrogen modes of transport to reinforce the city's resilience

Yokohama chose to shift towards hydrogen modes of transport by providing introduction subsidies for fuel-cell vehicles and hydrogen stations to encourage demand. Hydrogen vehicles enable significant energy savings through their efficiency, but also curtail carbon emissions, and foster the revitalisation of the region's industrial sector: the diversification of energy sources and stable energetic supply reinforce resilience. The commercialisation of such vehicles began in 2014 and focused on buses, initially to respond to large events' punctual demand (Rugby World Cup, Olympic Games), later extended to the network of public transportation and industrial and domestic uses. The new vehicles' supply chains are expected to reduce CO₂ emissions by 80%.

SDG 7 (TARGET 7.2)

PERU

Lima • Car-free days in historic city centre

The historic city centre of Lima is car-free for 12 hours on the last Sunday of every month: a ban has been instituted for all motorized transport (the first cause of air pollution in Latin America's most afflicted city), thus cutting greenhouse gas emissions from cars and promoting sustainable transport alternatives in the old and central district. Closing roads enables the setting up of socially inclusive artistic, educational, and gastronomic activities in which 7,000 people have already taken part, according to city estimations. Pollution is also largely reduced: particulate levels have more than halved – a reduction of 33 µg per cubic meter of particulate emissions has been observed –, and noise levels have dropped from 78 to 59 decibels.

SDG 3 (TARGET 3.9); SDG 11 (TARGET 11.6)

FRANCE

Dunkerque • An inverted toll to reward clean port calls

One of the Port of Dunkerque's proactive policies for sustainable maritime transport is the implementation of a reward system for clean port calls. In an effort to improve air quality through the reduction of polluting atmospheric emissions, the port encourages energy-efficient, low-emission vessels that have lesser impacts on the environment. A score is given to each of the 6,500 ships that go through Dunkerque in a year based on their atmospheric emissions – the higher the rating, the cleaner the vessel. The port then offers a yearly 100,000€ reward (a modest sum hopefully acting as an incentive for other ports) starting off in January 2020, to be split between the signatories of the charter underlining companies and charterers' commitments.

SDG 3 (TARGET 3.9); SDG 11 (TARGET 11.6)



INDIA

Bhopal • Fully-automated bike sharing system with dedicated lanes

Bhopal has launched a fully-automated Public Bicycle Sharing (PBS) system with 11 kilometres of dedicated bike lanes, increasing riders' safety. With 500 bicycles at disposal and 60 docking stations throughout the city, over 25,000 users have registered for their use in five months, more than half of them being women. This PBS system helps improve the connectivity of public transport, contributes to the reduction of vehicle emissions-induced air pollution, and shifts the image conveyed by bicycles from being widely used by poorer people to middle class uses. The expansion of the Bhopal bike lane network to over 50 kilometres is in the works: within a few years, it is set to become the country's most extensive bicycle-dedicated network.

SDG 3 (TARGET 3.9); SDG 9 (TARGET 9.1); SDG 11 (TARGET 11.2)

POLAND

Ostrów Wielkopolski • Integrated approach to public transportation

Ostrów Wielkopolski, in an effort to improve the city's quality of life, is modernizing urban transport by developing ecological public mobility (zero-emission electric buses – charged with municipally owned and produced biomass electricity–, city bike stations, an Interchange Centre, bike repair points), bound to improve air quality, reduce traffic congestion, increase reliability, and improve disadvantaged populations' travel conditions. Street lighting has been extended and modernized, an Intelligent Traffic Management System optimizing bus traffic has been put in place, and the city's bicycle paths now cover around 40 km. Shifting towards electric buses alone should, in 2020, have enabled the annual reduction of 617.36 tonnes of equivalent CO₂.

SDG 3 (TARGET 3.9); SDG 9 (TARGET 9.1); SDG 11 (TARGET 11.2)

TUNISIA

Tunis • Light rail to reduce congestion

Tunis faces severe congestion – a result of rapid urbanisation, extending suburbs, and of an inefficient public transportation system, which have so far encouraged the ownership of individual vehicles. The city is faced with the necessity of being restructured through a public transportation system that needs to respond to the demand-adequate, comfortable, safe, and fast expectations of passengers. The most pertinent consideration is the facilitation of daily commutes from the suburbs to the city centre. Tunis has found the answers to all such concerns in the extension of the Rapid Railway Network: 1 train carriage is estimated to replace 1,700 cars, allowing 600,000 passengers to benefit daily from the 5 light rail lines extended over 85 km.

SDG 9 (TARGET 9.1)

IVORY COAST

Abidjan • A multi-actor cooperation for a bicycle sharing system

In partnership with the District of Abidjan and the company SMOOVE, the NGO My Dream for Africa is setting up a bike sharing system in the city: announcements of the project are often broadcast on Ivorian television and radio. The objective is to reach a deployment of several thousand bicycles on 20 km of cycle paths by 2025. The first targeted area is that of the University of Houphouët-Boigny, which should ultimately have 500 bicycles at disposal over an area of 200 hectares. This first phase of the project should enable 50,000 students to benefit from these infrastructures – the aim will then be to extend the project to other municipalities in the city. In order to adapt the concept of self-service bicycles to the local context, the system now includes a payment method via mobile phone.

SDG 3 (TARGET 3.9); SDG 9 (TARGET 9.1)

ADAPTATION

UNITED STATES

Boston (Massachusetts)
• A waterfront park to absorb floods

SPAIN

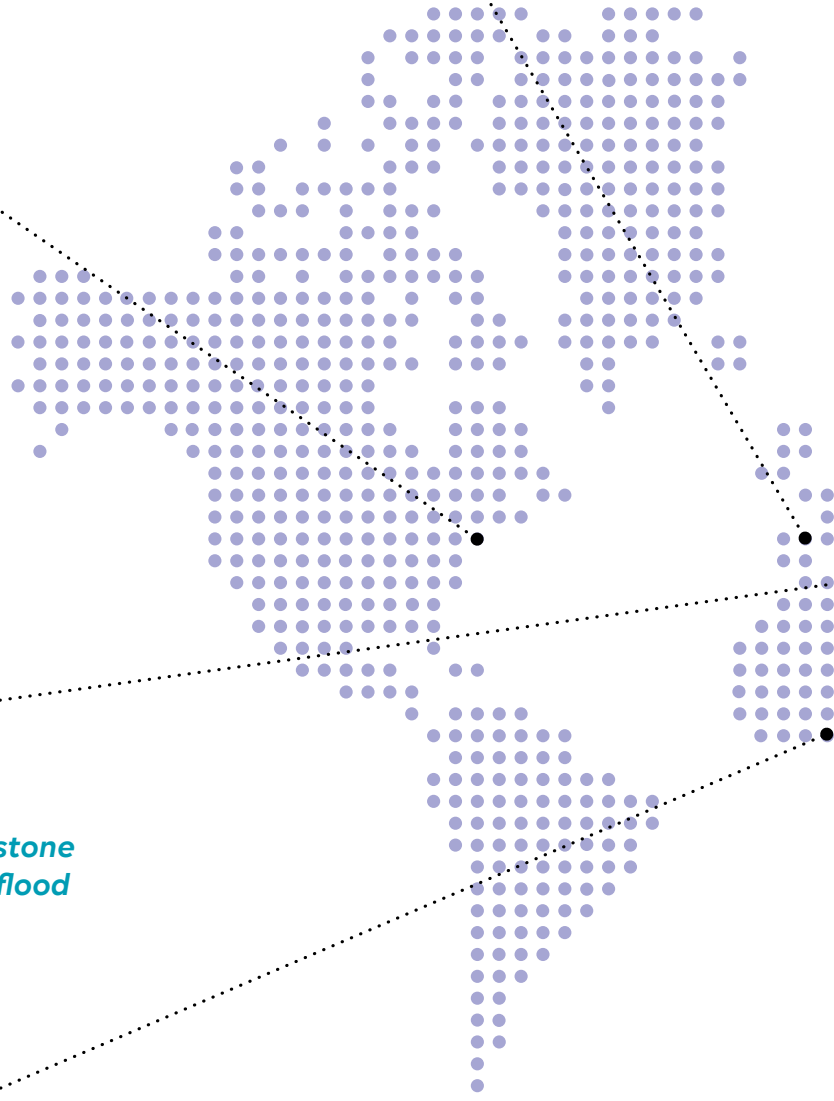
Barcelona • GBG_AS2C
Schools fighting against the heat island effect

ARMENIA

Artik • Closed stone pit waste and flood management

BENIN

Copargo • Hydro-agricultural improvements for agropastoralism





CROATIA
*Šibenik-Knin County •
An index to outline a
transversal and integrative
coastal plan*

INDIA
*Uttarakhand •
Strengthening State
Strategies for Climate
Action*

BANGLADESH
*Ganges-Bramhaputra
Delta • Hydroponics
and floating gardens*

SINGAPORE
*Singapore • Using
innovation to secure
water*



ADAPTATION

INDIA

Uttarakhand • Strengthening State Strategies for Climate Action

The state of Uttarakhand's inhabitants rely on rain-fed agriculture, which is compromised by the climate change-induced water scarcity the region is facing. Rising temperatures and erratic rainfall have caused landslides, threatening lives, livelihoods, and infrastructure. A water security enhancement project on 114 hectares reduces the region's vulnerability, and increases its adaptive capacity and resilience: to increase water storage capacity, check dams have been built on streams to slow the natural flow and help ground water recharge without depriving downstream users. Combined with rainwater harvesting infrastructure, this ensures sustainable access to water by reducing shortages and sparing women the time traditionally spent collecting water.

SDG 6 (TARGET 6.4); SDG 11 (TARGET 11.5); SDG 13 (TARGET 13.1)

UNITED STATES

Boston (Massachusetts) • A waterfront park to absorb floods

Instead of building a 6-kilometer sea wall costing €10.7 billion, as was planned, Boston is constructing a waterfront park to protect the city against rising waters (over 50 cm are expected by 2050). The wall would not give long-term protection, while a waterfront park is specifically designed to be flooded without being damaged. The city announced would be adding 67 acres of green coastal space and restoring 122 tidal acres. This project gives an opportunity to divert the flooding to specific locations while avoiding all issues linked to sea walls, starting with coastal erosion. The waterfront park will therefore capture, store, and use floodwater to reduce the harm floods may cause, and will provide green spaces and wildlife habitats.

SDG 13 (TARGET 13.1); SDG 11 (TARGET 11.3); SDG 14 (TARGET 14.2); SDG 15 (TARGET 15.9)

SPAIN

Barcelona • GBG_AS2C: Schools fighting against the heat island effect

Barcelona is a compact and populated city with a hot and humid climate, thus particularly prone to the heat island effect. Climate change is expected to worsen the phenomenon, to which the city's current infrastructure is not adapted. Schools are using a green, blue and grey strategy to counter infrastructure precariousness and upgrade the level of adaptation. The idea is to transform school playgrounds into climate shelters open to the wider public in non-school periods by establishing accessible municipal recreational points of refreshment throughout 10 schools. This network of 10 spatially distributed schools would add 4,500 m² of green urban areas benefitting children – particularly vulnerable – consistently throughout the year.

SDG 11 (TARGET 11.7); SDG 13 (TARGET 13.1)

CROATIA

Šibenik-Knin County • An index to outline a transversal and integrative coastal plan

Located on the Croatian coast, the Šibenik-Knin county has an important tourist activity, which accounts for its highly developed and often threatened coastline and marine zone. Climate change having caused rising temperatures and waters in the region, coastal flooding, weather extremes, wildfires and droughts have been greatly afflicting the county. The county has created an aggregated index of spatial development sustainability: it relies on 6 indicators of land take based on a ranking of the challenges faced by the infrastructure and on an evaluation of spatial development resilience. The index helps outline specific measures of coastal management and facilitates their implementation as well as the monitoring of further coastal developments.

SDG 6 (TARGET 6.4); SDG 11 (TARGET 11.3); SDG 13 (TARGET 13.1); SDG 12 (TARGET 12B); SDG 14 (TARGET 14.2)

**BANGLADESH*****Ganges-Brahmaputra Delta • Hydroponics and floating gardens***

Rising sea levels, increasingly violent monsoons and Himalaya's melting icecaps threaten land fertility in the Bay of Bengal, causing agriculture's share in the GDP to plummet from 50 to 20% in a decade. Salt-water intrusion and floods are ruining farmland, forcing farmers to urbanise or turn to shrimp farming. Others turn to a traditional form of hydroponics, weaving paddy straw and aquatic plants (namely water hyacinth, an invasive species) to create 20-metre-long platforms of organic material on which crops are planted. Their organic produce is thus safe from pests and last 3 months before being transferred on land: the local farming communities produce leafy vegetables, okra, gourds, eggplants and onions with these floating gardens.

SDG 2 (TARGET 2.3); SDG 11 (TARGET 11.3); SDG 13 (TARGET 13.1); SDG 15 (TARGET 15.3 & 15.8)

BENIN***Copargo • Hydro-agricultural improvements for agropastoralism***

A project to lay out a water retention basin on the market-gardening and forestry site of Tchandoga in the Copargo municipality is in progress. These hydro-agricultural developments are to benefit agropastoralism the local transhumance dynamic. The initiative focuses on mobilizing and storing surface water on the retention site, increasing revenues, restoring the site and managing it sustainably, and growing off-season crops. Practically, this is done through the cleaning, overburrowing and partial riprapping of the natural pond, the construction of a dyke, the reforestation of upstream and surrounding areas to delay drying out through evaporation and silting up, and awareness raising on the pond's watershed to prevent deforestation and pollution.

SDG 6 (TARGET 6.4); SDG 11 (TARGET 11.4); SDG 15 (TARGET 15.2)

SINGAPORE***Singapore • Using innovation to secure water***

With a daily consumption of 141 L per person in 2018, Singapore wants to reach 130 L by 2030 – an 8% reduction – regardless of its growing population. Climate change will likely cause Singapore to face extreme water stress by 2040. Singapore imports around half of its water from Malaysia, but the agreement expires in 2061: rising water prices create uncertainty regarding long-term imports, encouraging Singapore to work on water independency. It is dedicating \$670 million (€443 million) over 15 years to a malleable approach combining stringent conservation, re-use and innovation. Singapore has invested in underground drainage systems, dams, reservoirs, water recycling plants and desalination plants (to be run on solar power) that can so far provide 30% of demand.

SDG 6 (TARGETS 6.1 & 6.4); SDG 13 (TARGET 13.1)

ARMENIA***Artik • Closed stone pit waste and flood management***

Artik city is very exposed to hydro-meteorological threats, increasing in frequency and intensity because of climate change. No conservation or reclamation work was done for the region's mines, which provided 60% of the country's construction stone products, and have caused many environmental problems, most prominently floods. A project was put in place to improve the city's resilience and adaptation: it consists in managing floods to reduce the quantity of debris flowing to the municipality's reservoir because of strong winds, snowmelt and rainfall, which then pollutes natural agricultural lands – those include 300 ha of arable land, 190 ha of pastures, 15 ha of hay meadows, 640 ha of artificial forests, and 80 ha of water reservoir.

SDG 2 (TARGET 2.4); SDG 13 (TARGET 13.1); SDG 15 (TARGET 15.1)

EDUCATION & AWARENESS

UNITED STATES

*Columbia (Missouri) •
Nurses, meteorologists,
and city leaders
educate on climate
change*

BRAZIL

*Curitiba • Waste for
us tickets, school
textbooks, and food*

CHILE

*Santiago • Environmental
education in school
programmes*

SOUTH AFRICA

*Cape Town • Agri-Hub
Educating urban farmers to
organic agriculture*





FRANCE
Grande-Synthe • Ecological transition revenue

CROATIA
Zagreb • OAZA za Djecu: Non-institutional education in primary schools

ETHIOPIA
Addis Ababa • Gullele Botanic Garden

NEW ZEALAND
Wellington • FutureFit A behaviour change app that starts with city council staff



EDUCATION & AWARENESS

CROATIA

Zagreb • OAZA za Djecu: Non-institutional education in primary schools

OAZA za Djecu, the “Oasis for Children” project, consists in non-institutional education dispensed in 5 primary schools of Zagreb. The city hopes to promote environmental protection, sustainable development, healthy lifestyles, and volunteerism through school community gardens. This outdoor experience is also intended to give an opportunity to traditional classroom knowledge to be put into practice. The methods are varied to make students active participants in the local community: group work, discussion, deliberate games, demonstration by example, practical work, questions and answers, participation and peer-learning, and presentations are deployed. The project hopes to facilitate the connection between facts and the acquisition of knowledge.

SDG 4 (TARGET 4.7); SDG 12 (TARGET 12.8)

ETHIOPIA

Addis Ababa • Gullele Botanic Garden

Gullele Botanic Garden, Ethiopia’s first botanic garden, was inaugurated in January 2019 in Addis Ababa, protecting simultaneously endangered species and cultural heritage. Indeed, forest degradation and subsequent loss of biodiversity afflict Ethiopia, whose growing population and scarcity of agricultural land cause the endangerment of 13% of the total woody plant flora in Ethiopia and neighbouring Eritrea. According to the garden’s authorities, awareness – especially among youth – has improved significantly since the opening of the site, and visitation rates are high: more than 10,000 people visited the site in the first half of 2019. The in-situ conservation initiative now even constitutes the “green lung” of Ethiopia’s capital city.

SDG 4 (TARGET 4.7); SDG 11 (TARGET 11.4); SDG 15 (TARGET 15.2 & 15.5)

FRANCE

Grande-Synthe • Ecological transition revenue

Grande-Synthe has opted for the introduction of an ecological transition revenue. The initiative consists in municipal support for ecology-oriented activities under the auspices of a transition cooperative. Because the city’s overarching aim is to tackle precariousness while fostering social inclusion, these earnings are compatible with the guaranteed social minimum income established in March 2019 intended for Grande-Synthe inhabitants living below the poverty threshold. To benefit from the ecological transition revenue, one has to engage in an activity (which can be non-profit or associative) that initially is or is recognized as being ecological by the stakeholders involved (participating parties may include the city, associations, businesses, etc.).

SDG 1 (TARGET 1.2 & 1.3).

CHILE

Santiago • Environmental education in school programmes

Santiago, Chile’s capital city, has incorporated environmental education into municipal school programmes. Not only does the city wish to establish ecological school gardens as the norm, it also hopes to contribute to the upgrading of students’ learning processes by incorporating environmental education into pedagogical approaches. To make this shift possible, the methodology of environmental education incorporation entails a programme of environmental training tailored for teachers, assistants, and auxiliaries, as well as curricular innovation: educational orchards (to promote healthy and sustainable lifestyles) and logistical solutions (integral management of waste) are on their way to being systematically included in municipal schools.

SDG 4 (TARGET 4.7); SDG 12 (TARGET 12.8)

**BRAZIL****Curitiba • Waste for us tickets, school textbooks, and food**

Curitiba has put in place a waste exchange programme that enables citizens to gain transportation tickets, school textbooks, or even food from the appropriate disposal of waste. This measure of community engagement has enabled the implementation of new health norms, which have reduced by 99% the number of mosquito-related infections. The city's awareness to environmental issues – perceptible today with 90% of citizens recycling their waste and 80% using public transportation daily – has been fostered by the environmental education dispensed in local schools, with the hope that children would, in turn, sensitise and mobilise their parents. The city has also ensured 50 m² of green spaces per inhabitant, and 150 collective vegetable gardens.

SDG 3 (TARGET 3.3); SDG 9 (TARGET 9.1); SDG 11 (TARGET 11.6); SDG 12 (TARGET 12.5)

SOUTH AFRICA**Cape Town • Agri-Hub: Educating urban farmers to organic agriculture**

Cape Town offers organic farming training to local emerging fresh produce suppliers. Agri-Hub, dedicated to urban and small-scale farmers, has trained a network of 50 farmers in 6 months, and intends to train by 2020 an additional group of 22 urban farmers in organic farming methods to help them achieve quality assurance systems on their farms over the next year. The training academy shares standards, methodologies, and value-adding processes for producing organic crops in tunnels and open fields, to bring farms and crops to the highest-yielding standards, and eventually to bring urban and small-scale farmers to the forefront of a commercial-dominated market. Opportunities are also given to unemployed trainees intending to pursue agricultural studies.

SDG 2 (TARGET 2.4); SDG 12 (TARGET 12.8)

UNITED STATES**Columbia (Missouri) • Nurses, meteorologists, and city leaders educate on climate change**

Meteorologists, nurses, and city leaders of Columbia witness on a daily basis the effects of climate change within their fields of activity, and are taking action to find workable solutions, starting with awareness. Professionals from each sphere of competence have taken part in panel discussions centred around the impacts of and solutions to climate change, engaging on scientific, policy, and practical approaches with nursing students from the University of Missouri. While the scientific approach focused on current trends in climate patterns and misconceptions of climate change, the nurses insisted on the effects on health and nursing advocacy, and policy-makers exposed and reaffirmed their commitment to climate action and sustainability.

SDG 13 (TARGET 13.3)

NEW ZEALAND**Wellington • FutureFit: A behaviour change app that starts with city council staff**

The Wellington City Council is giving impulse to its shift to low-carbon through nudging, consisting of small incentivising measures. FutureFit is a behaviour change phone application developed within the city's Low Carbon Capital Plan and in collaboration with Auckland. The app was tried out with the city council's staff, which is already encouraged to favour non-motorised transportation and for whom a car-sharing scheme is in sight. The idea is to spread relevant and adapted information so as to facilitate low-carbon decision-making for citizens: it works through a personal carbon calculator that helps take action at the individual level. The project has also inspired Torokiki, a carbon calculator and reduction competition for local schools.

SDG 13 (TARGET 13.3); SDG 12 (TARGET 12.8)

DECENTRALISED COOPERATION

GERMANY-INDIA

*Karlsruhe & Nagpur •
Inspiring sustainable
mobility by showcasing
soft mobility*

UNITED STATES-LIBERIA

*San Antonio (Texas) &
Totota • Solar station,
micro-grid, and storage*

FINLAND (LAPLAND),
FRANCE (NORMANDY),
GREECE (EPIRUS), SPAIN
(ENERGY AGENCY OF
CASTILE AND LEÓN), ITALY
(POLIEDRA RESEARCH
INSTITUTE)

*Approve • Advancing
Public Participation
and stakeholder
engagement for
the improvement of
renewable Energy
policies*

UNITED STATES-AUSTRALIA

*Detroit & Sydney • FoodLab
Sydney: Food business
incubator*





**PARAGUAY-SENEGAL-
MOZAMBIQUE-VANUATU**
*Asuncion, Dakar, Maputo
& Port Vila • Making cities
sustainable and resilient*

NETHERLANDS-INDIA
*Rotterdam & Surat •
Integration of water
management and
climate adaptation*

FRANCE-GERMANY
*Epernay & Ettlingen •
A binational energy-
advising bus*

FRANCE-MEXICO
*Bordeaux & Guanajuato
• A sustainable
territorialised food
project*



DECENTRALISED COOPERATION

GERMANY-INDIA

Karlsruhe & Nagpur - Inspiring sustainable mobility by showcasing soft mobility

Karlsruhe and Nagpur are taking part in an expert and knowledge exchange programme on sustainable mobility and non-motorised transport. In 2018, a Nagpur delegation examined a number of urban cooperation opportunities with Karlsruhe, focused on low-carbon development, urban innovation, and integrating urban development and municipal services. In November 2018, Karlsruhe visited Nagpur to discuss specific areas of potential cooperation: active mobility (walking and cycling), multimodal transport platforms, increased accessibility, pedestrian traffic, and behaviour change. Nagpur wishes to balance economic development and conservation management, while Karlsruhe has an opportunity to anticipate the challenges it could face as a growing city.

SDG 9 (TARGET 9.1); SDG 11 (TARGET 11.2); SDG 17 (TARGET 17.16)

PARAGUAY-SENEGAL-MOZAMBIQUE-VANUATU

Asuncion, Dakar, Maputo & Port Vila • Making cities sustainable and resilient

These 4 countries are signatories of the Sendai Framework for Disaster Risk Reduction 2015-2030: these national governments share the responsibility of DRR with other stakeholders such as local governments. The partnership of the 4 crisis-prone cities (mostly facing hydro meteorological threats and hazards) revolves around city-to-city cooperation, peer-learning, capacity-building and direct cooperation. The pilot cities are also implementing the City Resilience Profiling Tool, which identifies gaps and opportunities for resilience-based urban development to provide a baseline for policy-making.

SDG 11 (TARGET 11B); SDG 17 (TARGET 17.17)

UNITED STATES-LIBERIA

San Antonio (Texas) & Totota • Solar station, micro-grid, and storage

The Bandera Electric Cooperative a citizen electricity cooperative based in San Antonio, southern Texas, developed a solar microgrid and storage project in Totota, Liberia, to power 400 local households and businesses in a city of 6,500 inhabitants. The solar station has a capacity of 70 kW with 220 San Antonio-made solar panels, a 90-kWh lithium-ion battery, and a backup generator. The microgrid is managed by the Totota Electric Cooperative, specifically created for the occasion. The solar plant will help create new businesses as much as it will multiply employment opportunities. The project promotes decentralised, ecological and independent energy production, which encourages other such solar plants to be created.

SDG 7 (TARGET 7.1 & 7.2); SDG 8 (TARGET 8.3); SDG 11 (TARGET 11.3)

FINLAND (LAPLAND), FRANCE (NORMANDY), GREECE (EPIRUS), SPAIN (ENERGY AGENCY OF CASTILE AND LEÓN), ITALY (POLIEDRA RESEARCH INSTITUTE)

Approve • Advancing Public Participation and stakeholder engagement for the improvement of renewable Energy policies

APPROVE is a 2018-2022 project of inter-regional cooperation throughout Europe on the low-carbon economy and the development of renewable energy sources (specifically, bioenergy). Regional stakeholders are encouraged to identify, share, and transfer good practices to improve existing policy instruments, palliate the lack of expertise and elaborate strategies to raise social acceptance while developing common ground for cooperation. The partners focus on awareness raising, capacity building, and effective stakeholder participation and involvement. Visits are organised to examine biogas production and electricity generation in view of developing second generation biofuels (from lignocellulose biomass, residues and waste).

SDG 7 (TARGETS 7.2 & 7.A.); SDG 17 (TARGET 17.17)



UNITED STATES-AUSTRALIA

Detroit & Sydney • FoodLab Sydney: Food business incubator

FoodLab Sydney is a network of small food businesses on the model of FoodLab Detroit, that custom-designs training courses to support local social and food enterprises. Targeting healthy and affordable food for all, the FoodLabs favour short circuit products, and thus implement a scaled policy of produce re-localisation. Providing employment pathways and access to sufficient quantities of affordable and nutritious food, the FoodLabs increase the cities' health, equity, and resilience. The Sydney Environment Institute will monitor the project, incidentally providing an in-depth analysis of food insecurity throughout Sydney and map the populations most vulnerable to lacks of easily accessible, nutritious and culturally appropriate foods.

SDG 2 (TARGETS 2.1 & 2.4)

FRANCE-MEXICO

Bordeaux & Guanajuato • A sustainable territorialised food project

Guanajuato and Bordeaux are cultivating their collaboration through a sustainable agriculture and food systems project. The bilateral programme fosters healthy nutrition through awareness campaigns and the provision of school meals, farmers using sustainable agricultural practices are being given greater access to markets, and the introduction of a waste processing plant in Guanajuato should help manage food waste better. Next among Guanajuato's priorities is improving the local production system by delineating protected areas for agriculture – as is done in Bordeaux –, thus preventing urban and industrial sprawl that would encroach on viable agricultural land. This multi-stakeholder partnership seeks to become engrained territorially.

SDG 2 (TARGET 2.1 & 2.4); SDG 11 (TARGET 11.3 & 11.A); SDG 12 (TARGET 12.3); SDG 17 (TARGET 17.17)

NETHERLANDS-INDIA

Rotterdam & Surat • Integration of water management and climate adaptation

The core of Rotterdam and Surat's cooperation is their common urban water challenges exacerbated by climate change. While Rotterdam has a long history of water management linked to its topography (partly below sea level), Surat hints at the problems Rotterdam might face, as both cities are confronted with population growth. Rotterdam gathered experience in the 1970s on flood risk management, urban drainage, and wastewater management, now reused in another context: Surat is working on new flood forecasting and water quantity monitoring models, on improving water quality monitoring procedures, and on storing water on rooftops to replenish the groundwater.

SDG 6 (TARGET 6.5); SDG 11 (TARGET 11.B); SDG 13 (TARGET 13.1)

FRANCE-GERMANY

Epernay & Ettlingen • A binational energy-advising bus

Epernay and Ettlingen are cooperating since 1953, and have recently turned to energy policy and climate protection to bolster their relationship. In 2019, the two cities jointly acquired and inaugurated a symbol of their cooperation: a binational energy-advising bus. The project aims to give advice on energy use and production, especially in rural areas. The bus, running on natural gas, will change location every 6 to 8 weeks to raise awareness in 211 municipalities and provide free information and guidance on energy savings and retrofit and environmental protection. By the end of 2019, Epernay hopes to have supported 50 households' energy refurbishment projects initiated through the energy-advising bus.

SDG 7 (TARGET 7.3); SDG 13 (TARGET 13.3)



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