European Commission

Workshop
Climate Change
Adaptation & Mitigation Measures

for Urban Local Bodies in India

Covenant of Mayors project team, JRC

Thursday, 25th February

Joint Research Centre

JRC Mission

As the science and knowledge service of the Commission
our mission is to support EU policies with independent evidence
throughout the whole policy cycle.

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Role of the JRC in the Covenant

- Research on existing methodologies and tools for the development of a CAP
- Development of technical guidebooks “How to develop a CAP”
- Continuous improvement of data collection process
- Evaluation of submitted CAPs, with feedback to Covenant cities
- Development of monitoring framework & instructions for signatories
- Overall assessment of the initiative and publication of reports
- Capacity building (technical trainings for cities and regions)
- Leading role in GCoM TWGs related to data and reporting

Outline

- Introduction
- **Mitigation**
  - Main principles
  - Examples
- **Adaptation**
  - Main principles
  - Examples
- **Energy access**
  - Main principles
  - Examples
- Q&A

The GCoM framework for local climate action

A very brief overview

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GCoM – 3 pillars for action

GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY

Decarbonisation

MITIGATION

Accelerating the decarbonisation of their territories

Resilience

ADAPTATION

Strengthening their capacity to adapt to unavoidable climate change impact

Secure, sustainable and affordable energy

ACCESS TO ENERGY

Allowing their citizens to access secure, sustainable and affordable energy

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Main milestones

10 key elements of a successful CAP

Formal adoption of the plan by the municipal council

1 Definition of clear **mitigation target(s)** and **adaptation goal(s)**

2 Sound **assessment of the local situation** (based on the BEI and the RVA)

3 **Strategies and actions until 2030** (or until the target year)

4 Compre-hensive **measures** addressing the key sectors of activity

5 CAP **submission** and validation

9 **Monitoring** and **reporting**

8 Identification of the key **financing** resources

7 Engagement of **citizens** and **stakeholders**

6 Mobilization of **all municipal departments** involved

The Mitigation pillar

Main principles and examples

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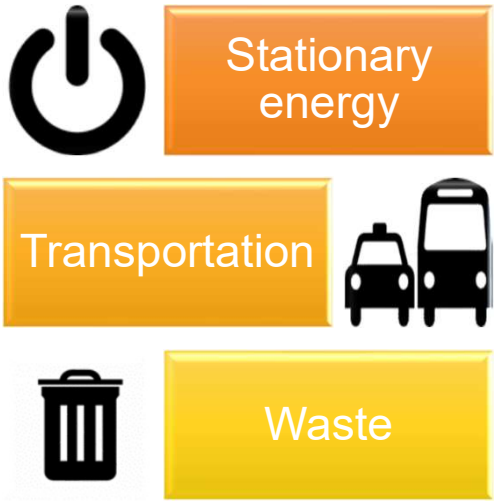
Principles and requirements – Assessing the current situation: the emission inventory

Mandatory – **emissions from 3 main sectors**:



Recommended where significant:

- Industrial processes and product use (IPPU)
- Agriculture, forestry and other land use (AFOLU)

Optional:

- Emissions from upstream activities (out-of-boundary sources)

Gases – **CO_2, CH_4, N_2O**

Principles for mitigation action planning

I. Prioritization of actions and the policy instrument(s) to implement the actions

II. Financial strategy for implementing the action- Urban policy tool –governance;

III. Implementation status and timeframe ; Stakeholders involved in planning and implementation of the action

IV. Assessment of energy saving, renewable energy production, and GHG emissions reduction (by action or sector; only applicable to mitigation action plans)

Estimated impact on activity	*	**Emission factors**	=	**Estimated impact on emissions**
Estimated impact on activity in terms of energy savings or renewable energy production [MWh]		Emission factors (EF) of the related activity [tCO_2/MWh]		total amount of GHG emissions reductions [tCO_2]

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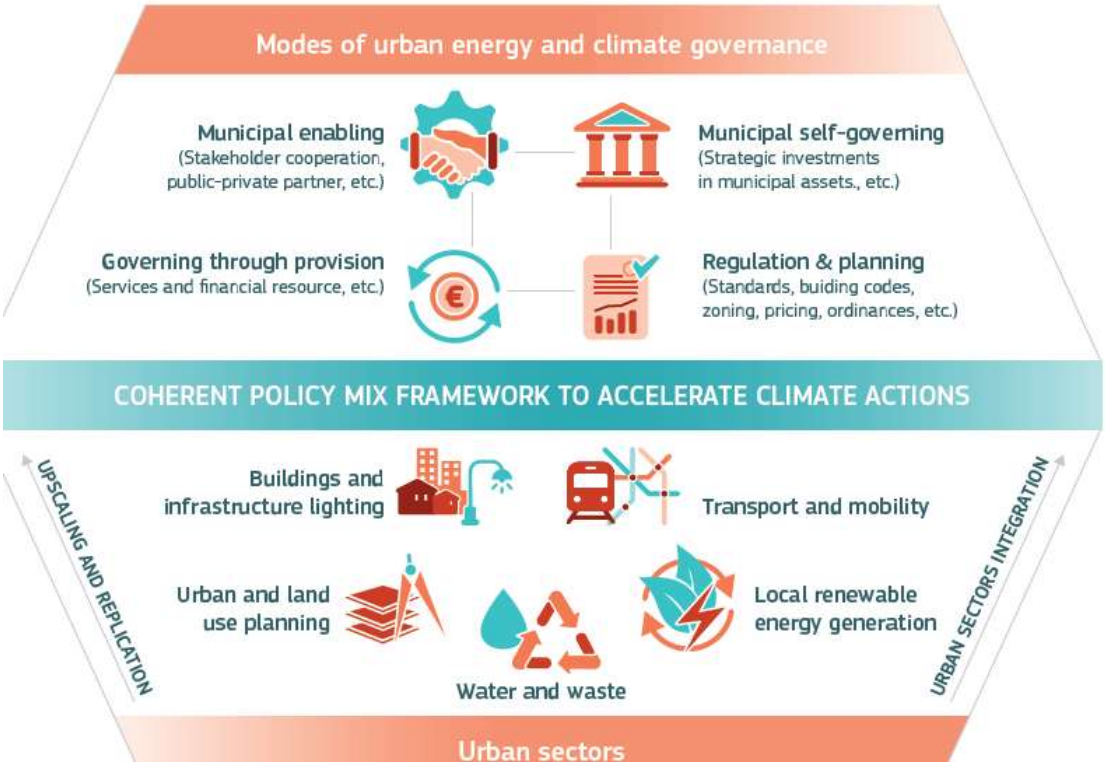
Modes of urban climate governance

I. **municipal self-governing (M1):** Local Authorities have the capacity to govern their own activities and undertake strategic investments in municipality-owned assets

II. **municipal enabling (governing through enabling) (M2):** Facilitating co-operation among stakeholders and awareness building

III. **governing through provision (M3):**Providing services and financial resources

IV. **governing by regulation and planning (authority) (M4):** local authorities govern by authority through setting regulations and putting forth urban planning principles



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Large scale building retrofit programme

Ljubljana, 279631 inh., Slovenia

- ✓ **Total project budget:** €14.9 million
- ✓ **Payback period:** 15 years

- **48 buildings retrofitted**, many of them city-owned (e.g. sports facilities, schools, kindergartens, administrative buildings, libraries and health centres).

- Energy-saving interventions: replacing standard lighting with **LEDs**, modernising **heating and air-conditioning**, **insulating walls and roofs** and **switching from fossil fuels to sustainable energy sources**.

- Buildings directly connected with the private partner's surveillance centre→ immediate response to any malfunctioning.

- **Knock-on benefits: improved quality of life and comfort** for building users, extra income due to energy savings (about €50,000 annually) allocated to a programme targeting school pupils to teach them about **energy saving behaviours** and renewable resources, increased consciousness of locals about sustainability issues

Primary school Jože Moškrič © Petrol

[Source: eumayors.eu]

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Supporting citizens' choices for more energy efficient buildings

Lahti, 120078 inh., Finland

- ✓ **2,500 properties** targeted by the campaign for decarbonizing heating
- ✓ **Total project budget:** €445,000

Vapaudenkatu 28, one of the buildings retrofitted using Energy Choice.
© Lahden Talot Ltd.

- **City objective**: to become **carbon neutral by 2025.**
- **"Energy Choice" project** launched in 2016 to help citizens to reduce CO2 emissions through shifting towards renewable sources.
- **Online platform** guiding citizens through the different available energy choices, e.g. on local energy production, the different energy sources and potential savings are calculated by a specialised company that uses data provided by the city. Citizens can use the platform free of charge by entering their property address into the service or selecting it from the map.
- **Results**: the platform has provided insight into properties' energy consumption, and helped make choices for retrofitting the houses that are oldest and in a worse condition and build new energy-efficient ones.

[Source: eumayors.eu]

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Fifty-Fifty Project in Hamburg

Hamburg, 1814597 inh., Germany

- Fifty-Fifty is an **energy and water saving programme** tested in 1994 in Hamburg in a number of schools.

- The key element is a system of financial incentives that enable the **schools to share the saving achieved in energy and water costs**. Teachers and pupils are encouraged to reduce their energy and water consumption simply by changing their **behaviours**.

- **50% of the money saved is returned to the school**, where it can be reinvested into new energy saving devices, equipment, materials and extra-curricular activities.

- **Knock-on benefits:** extra income due to energy/water saving measures (e.g. the Blankenese School bought solar panels with the money they saved), awareness raising.

[Source: Energy Cities]

- ✓ **450 schools participating**
- ✓ **Budget:** Between €300 and €500 per school/kindergarten

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Active travel in Barcelona

Barcelona, 1620343 inh., Spain

- Barcelona is developing a ‘Superblocks’ approach by redesigning the city’s streets to limit traffic and increase green and recreational spaces. **Green streets create a new environmental infrastructure**, where pedestrians and areas to relax in take priority.

- The basis of the initiative is to bundle the existing city blocks and create spaces reserved for cycling/walking, only retaining vehicular traffic on perimeter roads.

- Each superblock combines 12 city blocks to maximize public space and shape small neighbourhoods around which traffic flows, while inside spaces are repurposed to public-pedestrian friendly areas.

- **Aim:** build a city model with public space which is safer and healthier, conducive to social relationships, favourable for local commerce, centred around the needs of children and elderly people.

[Source: http://ajuntament.barcelona.cat/superilles/es/]

Public transport

- **Integrated fare systems:** London's Oystercard, Bremen's Mobility pass, the Netherland's smart card are some examples of integrated ticketing systems that **combine the services of different transport providers in one payment system**, which is linked through smart cards and/or apps. *[Examples: http://civitas.eu/collective-transport/ticketing]*

- **Bus priority lane:** Warsaw introduced a bus priority lane in the city centre stretching 7 km in each direction. The bus lane covers the city's main three-lane artery roads and serves three lanes in both directions. As result **the average speed of buses in both directions has increased by 19% faster to the east city edge and 30% faster to city centre**. *[Examples: http://civitas.eu/content/bus-priority-measures]*

Source: https://www.se.pl/warszawa/ztm-warszawa-nauczy-paryz-ekologicznego-transportu-szkolenia-juz-w-czerwcu-audio-aa-VMkr-nUeK-RLeG.html

Waste Sector GHG Mitigation Action Plan

Palembang, 1.66 million inh., Indonesia

The waste sector mitigation program is carried out in line with the solid waste and domestic wastewater sector policies rolled out by the **central and local governments**:

- Construction and operation of Organic Waste Processing Units (UPS);
- Construction and operation of a Recycling Center and Waste Bank;
- Refuse Derived Fuel (RDF) and utilization of methane gas at the Sukawinatan and Karya Jaya landfills;
- Education and cooperation in zero waste activities (waste reduction, sorting and processing), to all elements of society
- Aerobic (centralized) domestic wastewater treatment.

Source: <ahref="https://www.freepik.com/photos/green">Green photo created by jcomp - www.freepik.com

[Source: Draft Climate Action Plan of Palembang]

The Adaptation pillar

Main principles and examples

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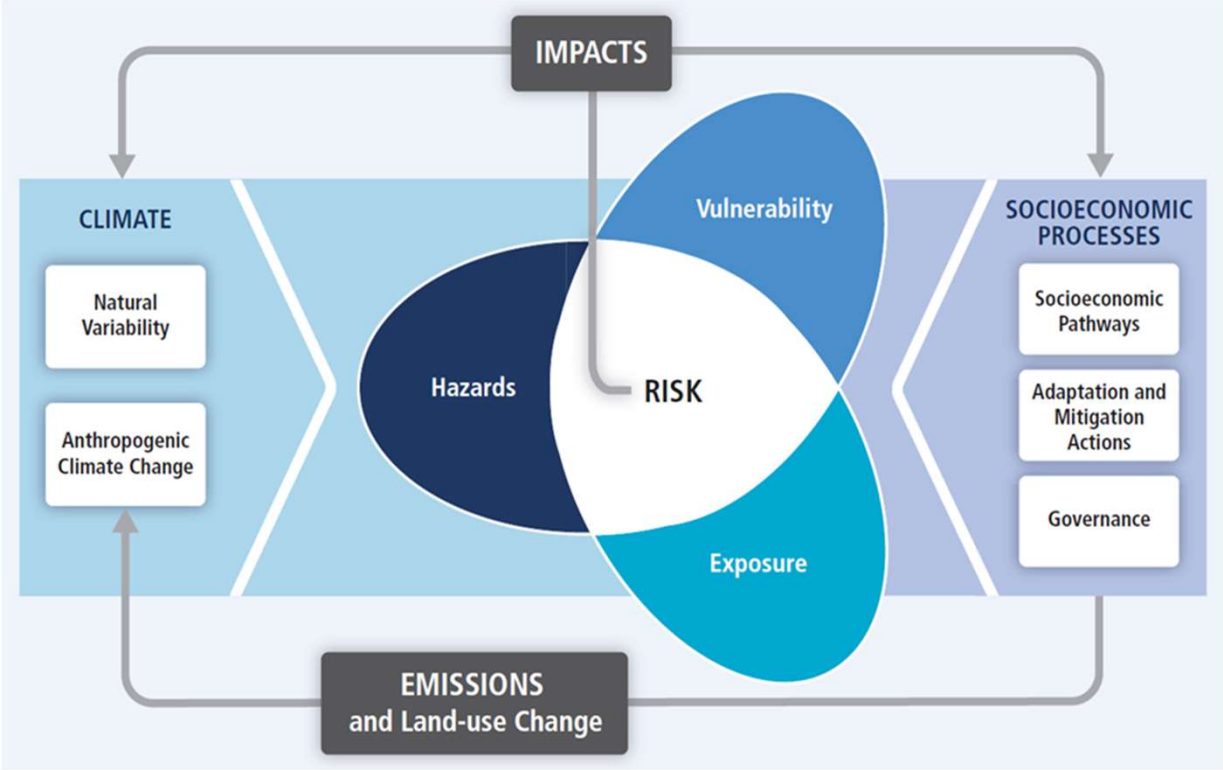
Visualizing climate risks: the IPCC framework



Source: IPCC, 2012. Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change.

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The adaptation cycle

- Get high-level political support
- RVA focussed on local contexts, identifying the most vulnerable sectors and prioritize them
- Identify possible synergies and/or conflicts (i.e. avoid ‘maladaptation’, maximise ‘win-win approach’)
- Set adaptation goal(s)
- Develop and implement actions aligned with the RVA
- Set up an implementation and MRV framework
- Monitor progress regularly, adjust if required.

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Eco-Street (DrainGarden®) in the municipality Ober-Grafendor (AT)

Two different **extremes** in the same area:

1. Heavy rainfall causes small scale **flooding**

2. Lack of precipitation + increased temperature causes **drought**

Based on observed climatic trends and **climate projections**, it is anticipated these problems will be exacerbated by future climate change.

Adaptation action:

Smart, ecosystem-based rainwater management system:

Vegetated roadside surface strips covered with special substrates of natural origin and plants that are able to absorb, retain, store and filter large amounts of water in short time.

Heavy precipitation events, drought periods

https://climate-adapt.eea.europa.eu/metadata/case-studies/environment-friendly-urban-street-design-for-decentralized-ecological-rainwater-management-in-ober-grafendorf-lower-austria/#adapt_options_anchor

Blue-Green Factor in Turku (FI)

Run-off water

Heavy precipitation increases Runoff water and hence **flooding**

The lack of green areas and absorption surfaces in the urban area contribute to the problem.

Adaptation action: Blue-Green Factor

The Blue-Green factor is a tool for urban planning that allows ensuring sufficient green and blue infrastructures for new developments.

Limits to the amount of impervious area and increases green area while retaining a larger volume of stormwater in blue areas and hence reducing flooding.

iwater project: http://www.integratedstormwater.eu/pilot-site/turku

Reforestation in Cascais (PT)

Forest fires are very common in Portugal. In the future, increasing temperatures and decreasing precipitations can increase the fire danger conditions.

To reduce the fire hazard conditions, Cascais considered as key measures planting and reforestation actions to prevent the spread of invasive species, and to implement fire hazards plans.

https://www.covenantofmayors.eu/about/covenant-community/signatories/actionplan.html?scity_id=1869

Fires

Authorities focus on reforestation in aftermath of Sintra-Cascais fire

By TPN/Lusa, in News · 08-10-2018 08:29:00 · 0 Comments

The fire that blazed through the Sintra mountain range on Saturday night has been put out and it is now time to clean up and prepare for reforestation of the burned area using native trees, the Mayor of Cascais said late on Sunday night.

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The Energy Access pillar

Main principles and examples

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Energy Access – attributes

SECURE	SUSTAINABLE	AFFORDABLE
Adequate and reliable access to energy	Provision of energy while minimizing the impact on the environment	Accessible for all Universal access

Energy Access: Indicators

INDICATORS: Access to electricity

1. Percentage of population or households having access to electricity (grid/off-grid) [%]

Secure

2. Number of hours per day of available electricity [*h/day*]
3. Average number of electricity interruptions per day [*n°/day*]
4. Number of days without electricity per year [*n°/year*]

Sustainable

5. Percentage of electricity from RES [%]
6. Number of minigrids and stand-alone systems [*n°*]
7. Laws and regulations in place for mini-grids/stand-alone systems [+/-]

Affordable

8. Percentage of population able to pay for electricity [%]
9. Percentage of expenditure of Public Buildings for electricity [%]
10. Financial and regulatory incentives for renewable energy in place [+/-]

Energy Access: Indicators

INDICATORS: Access to clean cooking

1. Percentage of population /households with clean cooking access [%]

Secure

2. Percentage of pop./households relying on traditional biomass [%]
3. Percentage of pop./households relying on LPG or other sources [%]
4. Time and distance to gather fuelwood [*h and km*]

Sustainable

5. Number of improved cook stoves [*n°*]
6. Charcoal produced in sustainable way[*Y/N*]
7. Awareness / Education programmes in place [*Y/N*]

Affordable

8. Financial and regulatory incentives in place [+/-]
9. Percentage of pop. able to pay for the transition to clean cooking [%]

**Clean cooking as defined by IEA: access to and primary use of modern fuels (natural gas, LPG, electricity, biogas) and technologies (as improved cook stoves)*

Understanding Energy Access in Central African Republic

- **City of Bangui**
- **730.000 inhab.**
- **SEACAP under review**

- Organization of focus groups to collect direct quantitative and qualitative evidence of use of electricity and use of cooking from citizens;
- Engagement of borough representatives, citizens organizations, female and youth groups

- Guided focus groups with interviews covering:
- Type of energy and cooking systems used and available
- Costs and willingness to pay for different energy and cooking options
- Preferences and perceptions on the different alternative options

Outcome of the focus groups used to inform the SEACAP production

Energy Access Actions in Cameroon

- **City of Doumé**
- **22.500 inhab.**
- **SEACAP prepared at the end of 2020**

- Construction of photovoltaics power plants to support local energy consumption
  - Indicative size: 300kW
  - 5 plants planned between 2021-2026

Electrification of health infrastructures with stand alone photovoltaic systems
-Indicative size: 2kW
- 15 facilities planned between 2021-2026

Supply of improved cook stoves
- 1500 units planned between 2021-2023

Icons source: the Noun Project: Central African Republic by P Thanga Vignesh, Africa by Ted Grajeda, group discussion by ProSymbols, Puzzle by Agarunov Oktay-Abraham, Document by Vectorstall

Energy Access Actions in Cameroon

- **City of Yaoundé (IV arrondissement)**
- **792.500 inhab. (overall capital population of 2.8M inhab.)**
- **SEACAP prepared at the end of 2019**

Supply and installation of photovoltaics powered street lamps

- 65 units planned for 2021
- The action will engage local population in the stages of installation, operation, maintenance and recycling of faulty units

Icons source: the Noun Project: streetlamp by IconMark, Cameroon pointer by K Thanga Vinesh, Africa by Ted Grajeda

Energy Access Actions in Togo

- **City of Tsevié**
- **54.000 inhab.**
- **SEACAP under preparation**
- **Actions carried out under the EU funded "Promoting Energy for Development programme"**

- Provision of solar home system to low income households
- Electrification of 5 schools and 5 health centers

- Lighting of main city streets with solar street lamps
- Training of youth for maintenance of solar equipment

Supply of improved cook stoves
- 8200 households covered between 2019-2021

Icons source: the Noun Project: , Africa by Ted Grajeda, togo by P Thanga Vignesh, Solar panel by Vector Point, Fire by P Thanga Vignesh

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Thank you

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