

The European Commission's science and knowledge service

Joint Research Centre



Key principles for climate action planning

*City energy and Climate Action: How to set targets
and Develop a Plan.*

September 12-13th 2018 . Surabaya City, Indonesia

S Rivas/ JF Dallemand

European Commission Joint Research Center

ACTION PLAN PILLARS

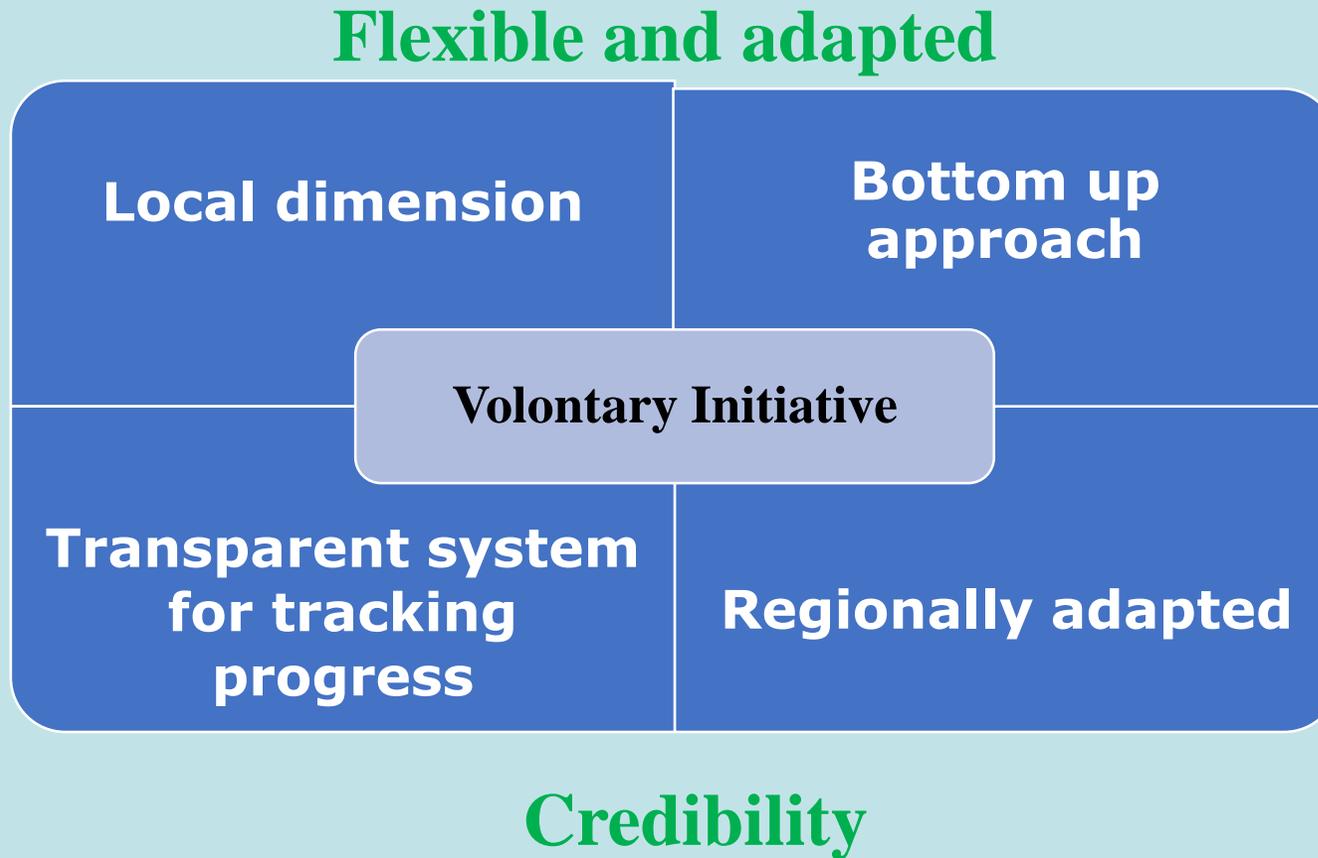
MITIGATION
LOW CARBON CITIES

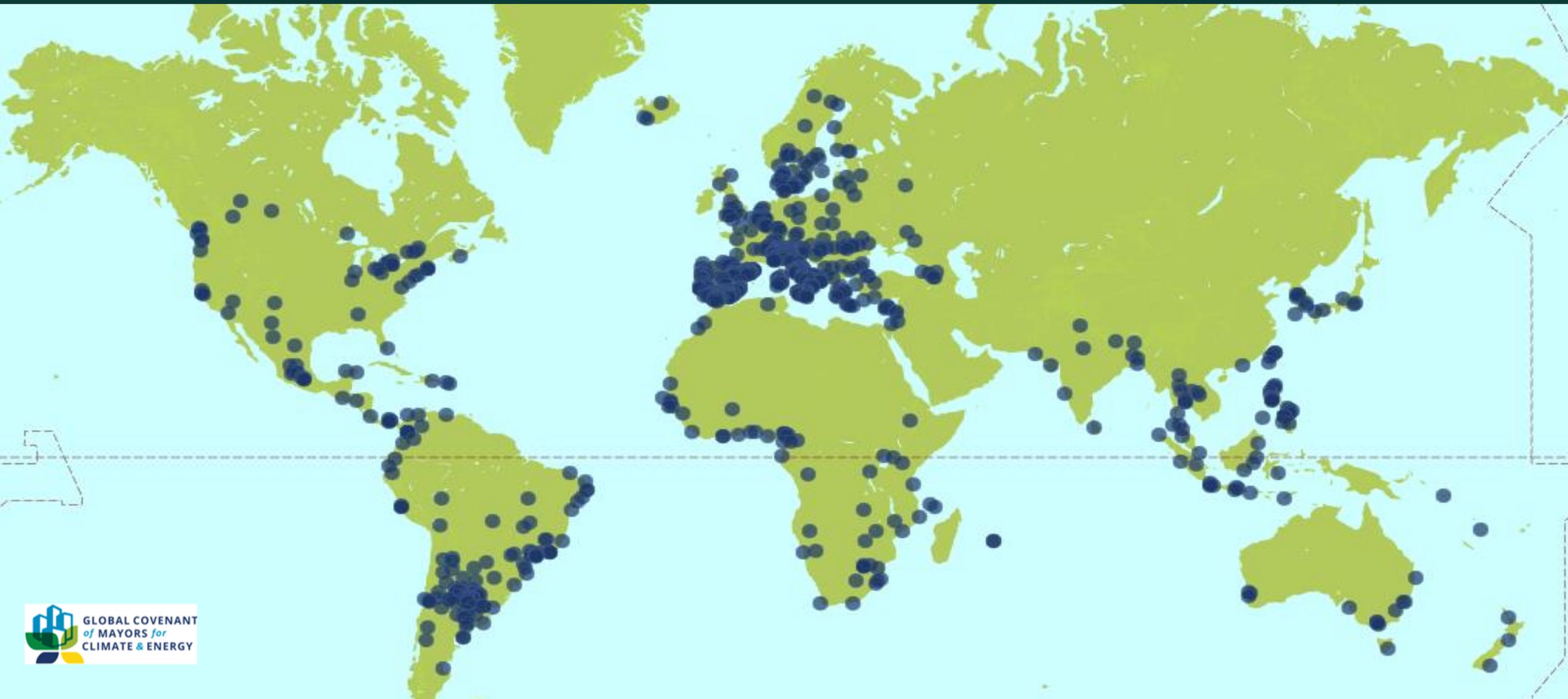
ADAPTATION
RESILIENT CITIES

**SECURE,
SUSTAINABLE
AND AFFORDABLE
ENERGY**

- Going beyond NDCs in their respective territories by 2030
- Increased resilience to the impacts of climate change
- Increased cooperation with fellow local and regional authorities within the EU and beyond to improve access to secure, sustainable and affordable energy

Peculiarities of Global Covenant





What is an Action Plan (i.e SECAP)?

It is a document describing

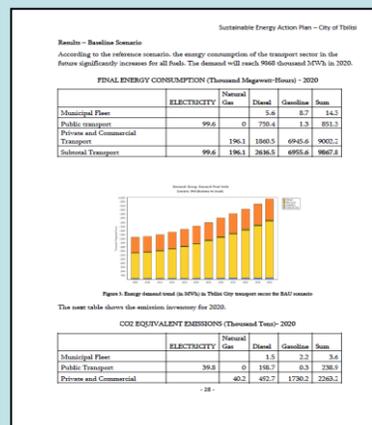
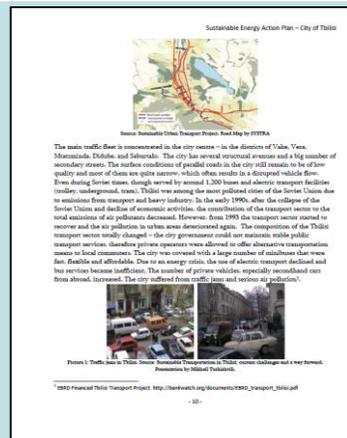
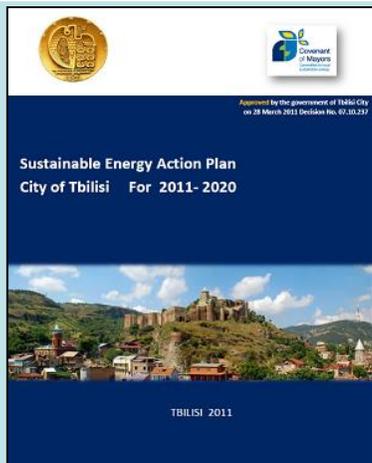
- 1. a set of actions, energy related towards the reduction of the total GHG emissions on the municipality by a % by a due date**
- 2. a set of actions towards enhance the resilience and adaptation to climate change of the municipality**

A summary of the action plan to be provided on a online template

What is an Action Plan ?

Its nature is threefold:

- ✓ A political document
- ✓ A technical document, reference for the implementation and monitoring of the actions
- ✓ A communication and promotion instrument for the stakeholders



Code	Action	Start	End	Responsible
A1	Energy audit of public buildings	2011	2012	Public Administration
A2	Energy audit of private buildings	2011	2012	Public Administration
A3	Energy audit of commercial buildings	2011	2012	Public Administration
A4	Energy audit of industrial buildings	2011	2012	Public Administration
A5	Energy audit of residential buildings	2011	2012	Public Administration
A6	Energy audit of public buildings	2011	2012	Public Administration
A7	Energy audit of private buildings	2011	2012	Public Administration
A8	Energy audit of commercial buildings	2011	2012	Public Administration
A9	Energy audit of industrial buildings	2011	2012	Public Administration
A10	Energy audit of residential buildings	2011	2012	Public Administration
A11	Energy audit of public buildings	2011	2012	Public Administration
A12	Energy audit of private buildings	2011	2012	Public Administration
A13	Energy audit of commercial buildings	2011	2012	Public Administration

Key principles

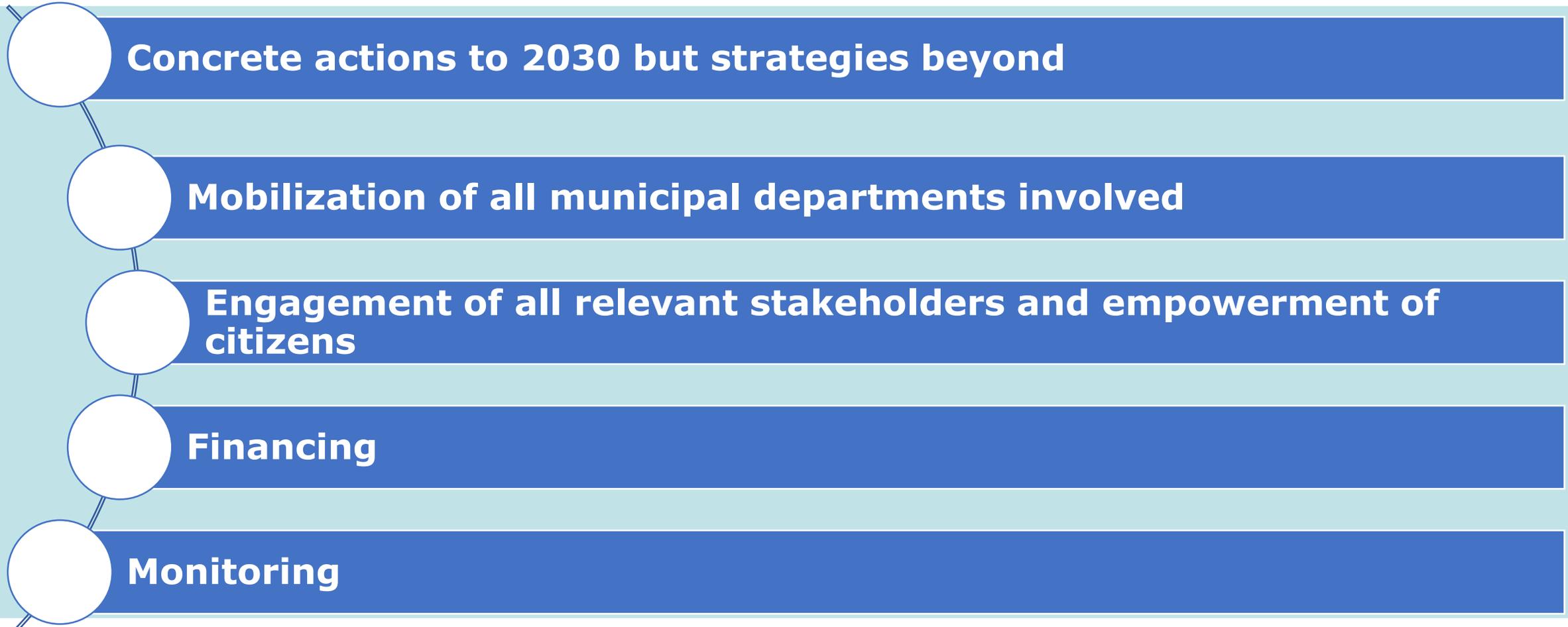
Approval by the municipal council

Concrete commitment for a reduction of CO2 in the territory under municipal jurisdiction

Pan based on assessments: baseline emission inventory (BEI) and risks and vulnerabilities assessment (RVA)

Comprehensive measures covering key sectors

Key principles



Mitigation planning

1. **STEP 1:** select the sectors to be tackled

Based on the results of the BEI and the actual feasibility of implementing the actions (soundness)

2. **STEP 2:** set the target

3. **STEP3:** set the actions in each sector that will allow reaching the target.

Mitigation planning STEP 1



For STEP 1

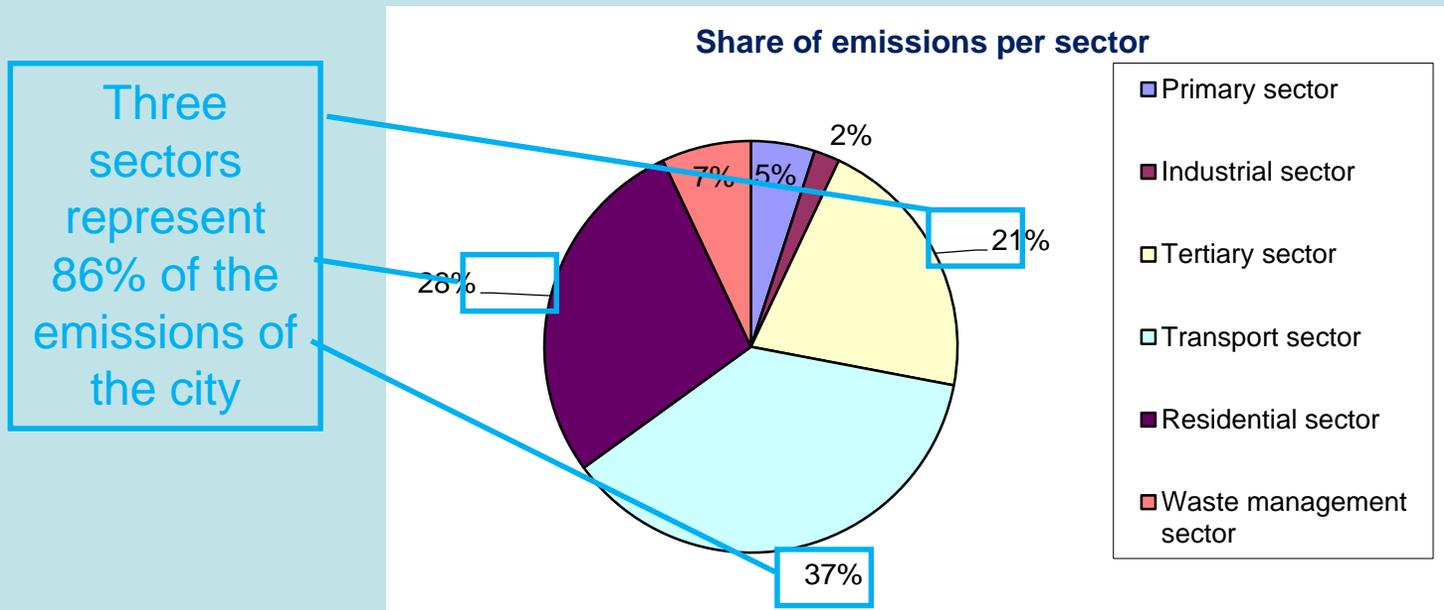
key principles

- 1) The GCoM follows essentially (but not exclusively) a **territorial approach**, looking at the GHG emissions on the territory of the local authority.
- 2) The focus is on **Final Energy Consumption**
- 3) The actions focus on **Energy Efficiency** and promoting distributed generation from **Renewable sSources**.



Sectors

BEI quantifies the amount of CO₂ emitted due to final energy consumption in given activity sectors on the municipality's territory within a calendar year and it helps to select the appropriate actions.



Example: Castelldefels (Spain)

Mitigation planning: STEP 2

The local authority (in general) can decide setting the overall CO₂ emissions targeting terms of:

- 'absolute' reduction compared to the BEI
- 'per capita' reduction compared to the BEI
- "absolute reduction compared to a BAU" or reference scenario
recommended

Setting mitigation targets

	EU-28	Eastern Partnership Cities	Southern Partnership Cities
Target	40% by 2030	30% by 2030	Beyond the NDCs
Reduction target <i>as compared to BEI emissions</i>	Absolute terms [tCO ₂]	Absolute terms [tCO ₂]	Absolute terms [tCO ₂]
	Relative terms [tCO ₂ /capita]	Relative terms [tCO ₂ /capita]	Relative terms [tCO ₂ /capita]
<i>as compared to BAU emissions</i>	Not allowed	Absolute terms [tCO ₂]	Absolute terms [tCO ₂]
Base year	1990 recommended	A recent year representative of current situation	1990 recommended or if data is not available more recent year
Key sectors	CoM EU key sectors	As CoM EU + solid waste and waste water recommended	As CoM EU + solid waste and waste water recommended

EC-JRC Business as usual scenario

The EC-JRC **Business as Usual** scenario used to calculate future CO₂ and CO₂eq emissions explores the situation when no further climate and air pollution policies are implemented beyond what was in place in 2005.

- Calculated energy consumption from 2005 to 2050 is driven by population and economic growth but not by energy efficiency/climate change policies.
- Existing combustion technologies/abatement measures per region are assumed not to change beyond the year 2005.

Applying the BAU approach when calculating 2030 targets

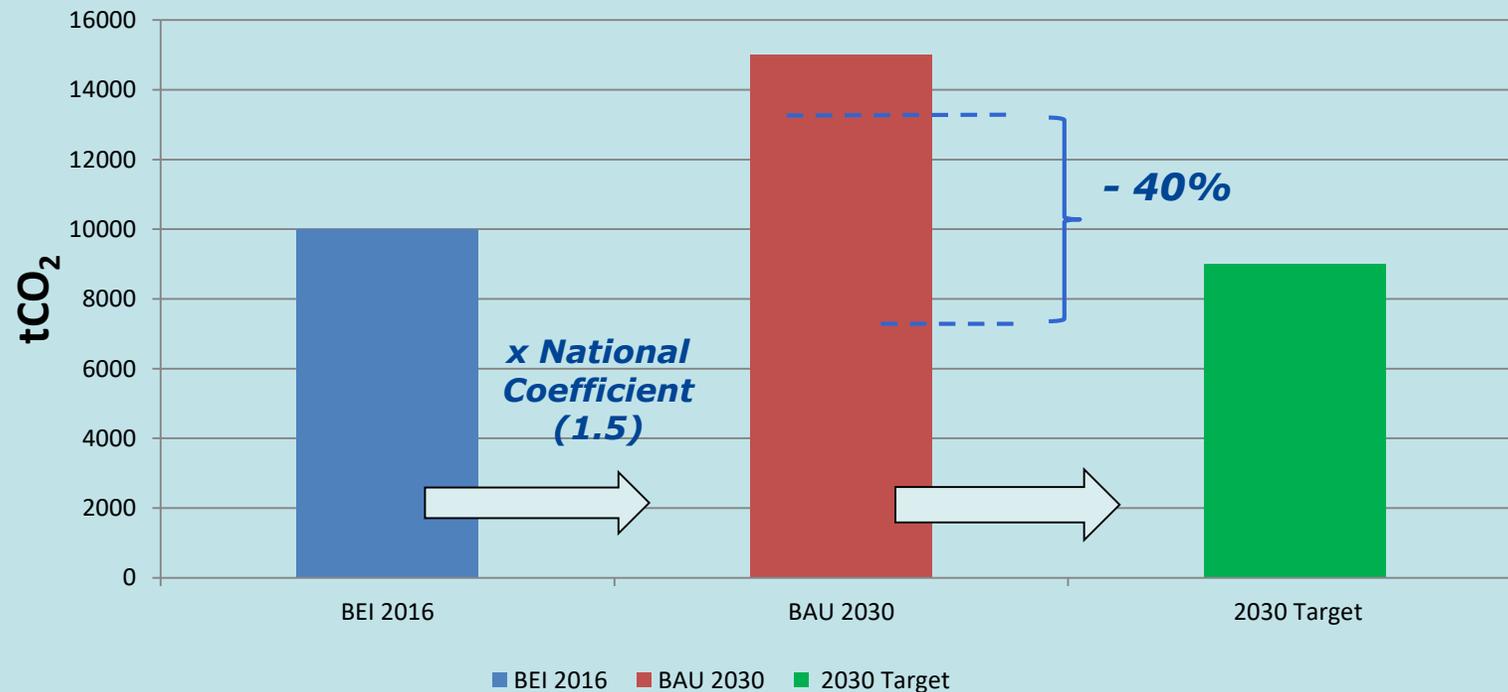
Example: Tunisian municipality, Base year 2016, BEI = 10000 tCO₂

CoM South BAU National Coefficients

Country	BEI year													
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Algeria	1.08	1.06	1.05	1.03	1.01	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.01	1.01
Egypt	1.22	1.15	1.08	1.02	0.96	0.97	0.97	0.98	0.98	0.99	0.99	0.99	1.00	1.00
Israel	1.47	1.43	1.40	1.36	1.33	1.29	1.26	1.23	1.20	1.16	1.13	1.09	1.06	1.02
Jordan	1.57	1.51	1.46	1.41	1.36	1.33	1.29	1.26	1.22	1.18	1.14	1.10	1.07	1.03
Lebanon	1.53	1.48	1.43	1.39	1.34	1.30	1.27	1.24	1.20	1.17	1.13	1.10	1.06	1.02
Morocco	1.54	1.47	1.40	1.34	1.28	1.25	1.22	1.19	1.16	1.13	1.10	1.07	1.05	1.02
Palestine	1.63	1.57	1.52	1.46	1.41	1.37	1.33	1.29	1.25	1.20	1.16	1.12	1.08	1.03
Tunisia	1.50	1.43	1.37	1.31	1.25	1.23	1.19	1.17	1.14	1.12	1.09	1.07	1.05	1.02

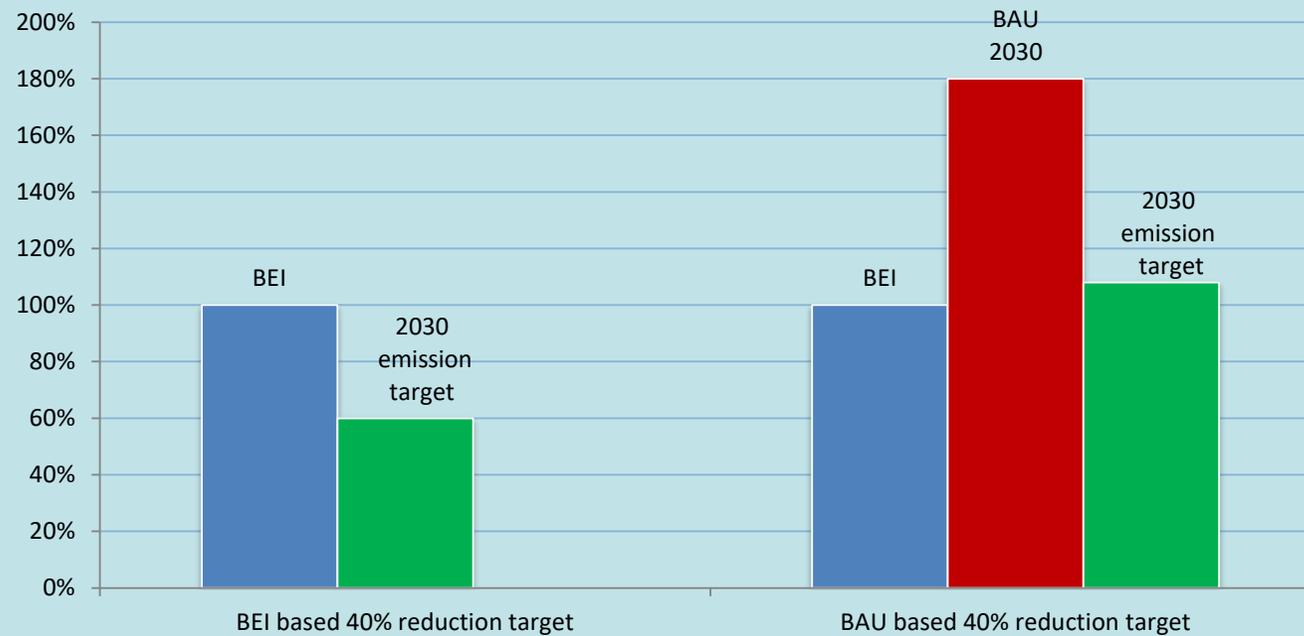
Applying the BAU approach when calculating 2030 targets

**Example: Tunisian municipality, Base year 2016,
BEI= 10000 tCO₂ BAU=15000 tCO₂ 2030 target= 9000 (0,4*15000)**



BAU 2030 emissions = BEI Emissions x National Coefficient

Setting mitigation targets



When using a BAU-based approach, the 2030 targeted emissions may be higher than the BEI emissions

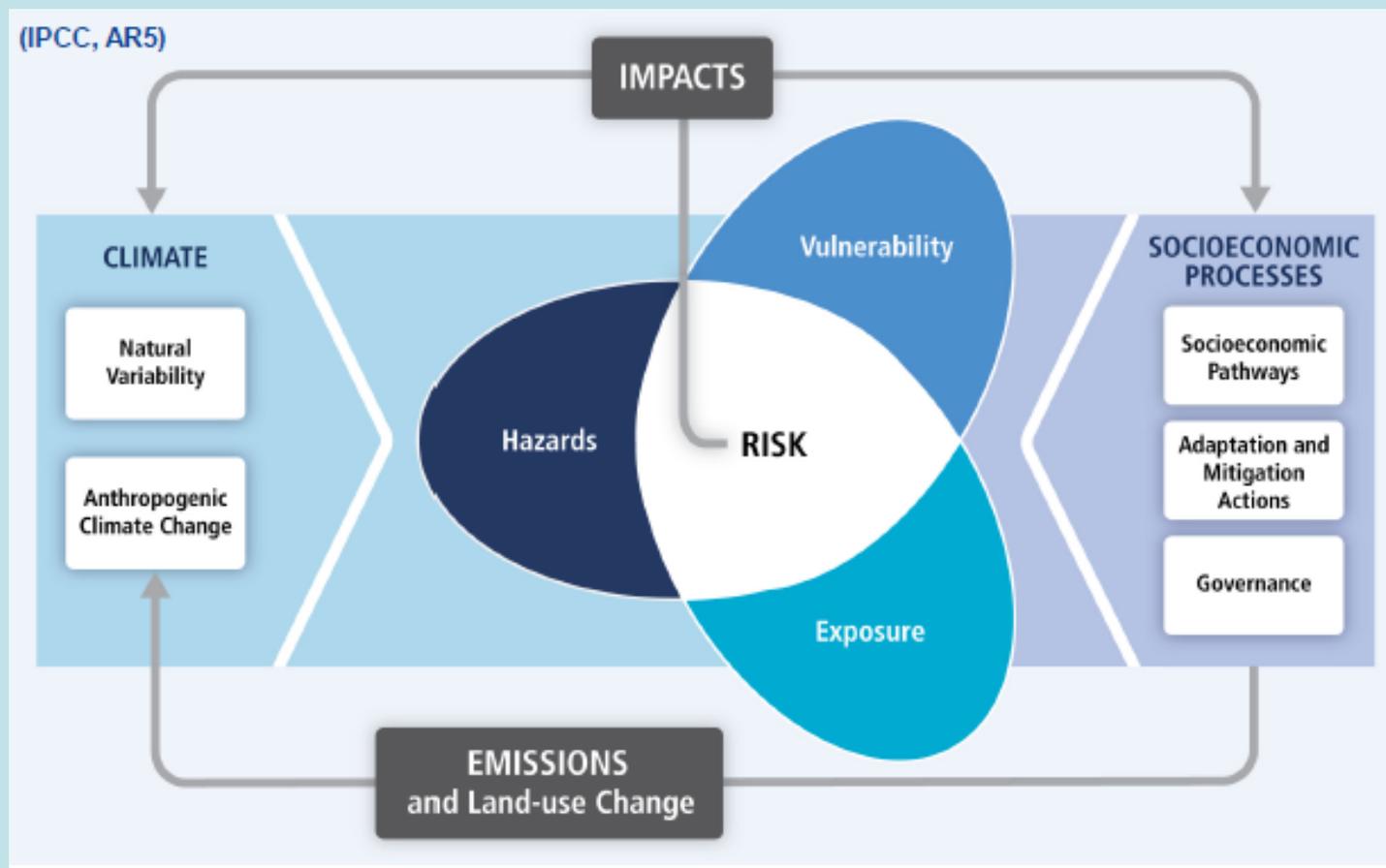
BAU versus BEI 40% reduction target

Adaptation planning

Five key requirements

1. Identification of current and future climatic hazards
2. Identification of critical infrastructure
3. Active stakeholder participation
4. Avoid maladaptation
5. Estimate implementation action costs

Adaptation planning



Adaptation planning

1. Identification of current and future climatic hazards

- Floods:
 - a. River floods
 - b. Flash floods
 - c. Coastal floods
- Droughts
- Wildfires/Forest fires
- Wind storms
- Heatwaves
- Cold waves
- Landslides
- Avalanches
- Sea level rise

Source: Ciscar et al., 2014.

Adaptation planning

2a. Identification of critical infrastructure

1. Communication technologies
2. Education
3. Energy
4. Healthcare systems
5. Heavy industries
6. Security
7. Transport
8. Waste treatment
9. Water

Source: EEA, 2012; Forzieri et al., 2015; IPCC, 2014; OJEU, 2008.

2b. Essential requirements for critical infrastructure

1. An inventory of all critical infrastructure available within the Municipality.
2. An inventory of all critical infrastructure located beyond the city boundaries that may put the city at risk under climatic disaster events (e.g. heavy industries).
3. Level of risk for each critical infrastructure facility.

Source: EEA, 2012; Forzieri et al., 2015; IPCC, 2014; OJEU, 2008.

Adaptation planning

3a. Active Stakeholder Participation

1. Experts in climate change.
2. Public sector:
 - Planning authorities.
 - Authorities concerned with disaster risk management.
3. Private sector:
 - Business organisations.
 - Trade unions.
4. Other stakeholders:
 - NGOs.
 - Citizens concerned with disaster risk management.

Source: EEA, 2016; Hernández et al., 2016.

3b. Essential requirements for participation

1. Inventory of all relevant stakeholders and the level of participation (see the definitions in the annex):
 - **Level 1: Involvement.**
 - **Level 2: Collaboration.**
 - Level 3: Delegated power.
 - Level 4: Citizen control.
2. A list of stakeholders that did not participate and an explanation of their reasons.

Source: Arnstein, 1969; IAP2, 2017.

Adaptation planning

5. Estimate implementation action costs

1. An estimation of the investment and maintenance costs of all proposed adaptation actions. There should not be an action without its correspondent cost estimation.
2. Adaptation actions should have a time horizon for their implementation.
3. Actions should have allocated funding.

Source: EEA, 2016.

Adaptation planning

4b. Five types of maladaptation and examples

1. **Increasing GHG emissions:** energy-intensive air conditioners in response to heat waves, or desalination plants for water supply based on fossil fuel production.
2. **Burdening the most vulnerable:** adaptation actions that imply increasing prices to lower income families.
3. **High opportunity costs:** adaptation actions with higher economic, social, and environmental impacts than other alternative actions.
4. **Reduce incentive to adapt:** rebound effects, e.g. the introduction of new technologies that reduce water prices, inducing water consumption.
5. **Inducing path dependency:** large capital commitments, leading to paths difficult to change in the future, e.g. large infrastructural investments with high opportunity costs.

Source: Barnett and O'Neill, 2010.



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