

Urban Energy for a Carbon Neutral Future

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Mikael Jakobsson
Executive Director, APUEA
CEO, NXITY

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Supported by

Carbon Neutrality

Net zero GHG emissions

Net zero GHG emissions refers to achieving an overall balance between greenhouse gas emissions produced and greenhouse gas emissions taken out of the atmosphere – not only carbon.

Low carbon

Low carbon means a system is highly energy efficient and partially powered from on-site and/or off-site renewable energy sources.

Zero carbon

Zero carbon emissions are being produced. No carbon was produced in the first place.

Carbon neutral

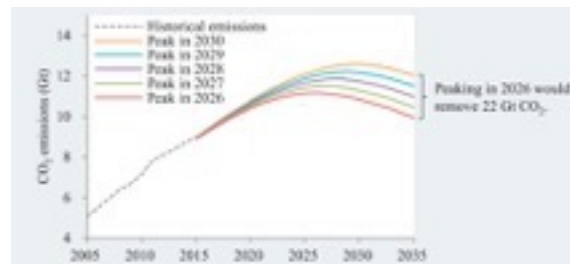
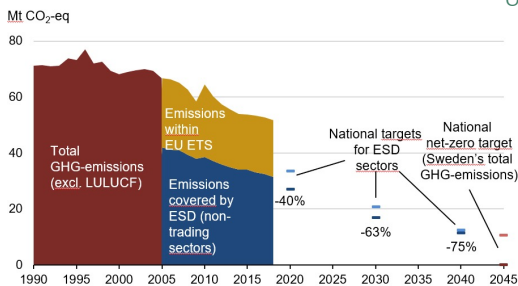
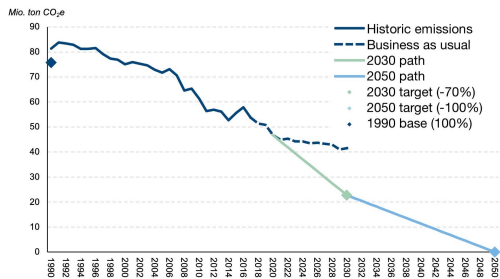
Carbon emissions caused have been balanced out by “offset”, i.e. by funding an equivalent amount of carbon savings elsewhere.

Carbon negative/climate positive

Reducing the carbon footprint to less than neutral – removing more CO₂ from the atmosphere than it emits.

Examples of countries with Carbon Neutrality targets:

Region	Country	Year	Status
Asia	China	2060	Policy position
	Japan	2050	Statement of intent
	Kazakhstan	2060	Submission to UNFCCC
	Singapore	2050-2100	Submission to UNFCCC
	South Korea	2050	Policy position
Oceania	Australia	2050-2100	Pledged towards Paris Agr.
	Fiji	2050	Pledged towards Paris Agr
	New Zealand	2050	Law
Europe	Denmark	2050	Law
	Finland	2035	Coalition agreement
	France	2050	Law
	Germany	2045	Law
	Sweden	2045	Law
	UK	2050	Law
	North America	Canada	2050
	US	2050	Statement of intent



Systemic efficiency

Urbanization – Growing population – Climate change

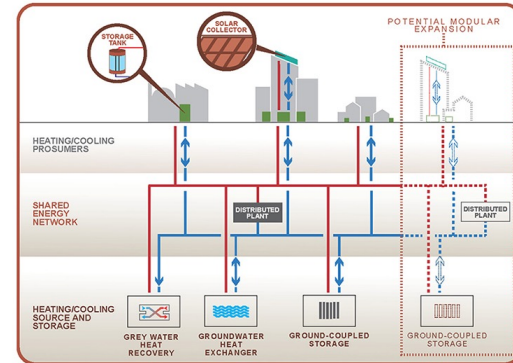
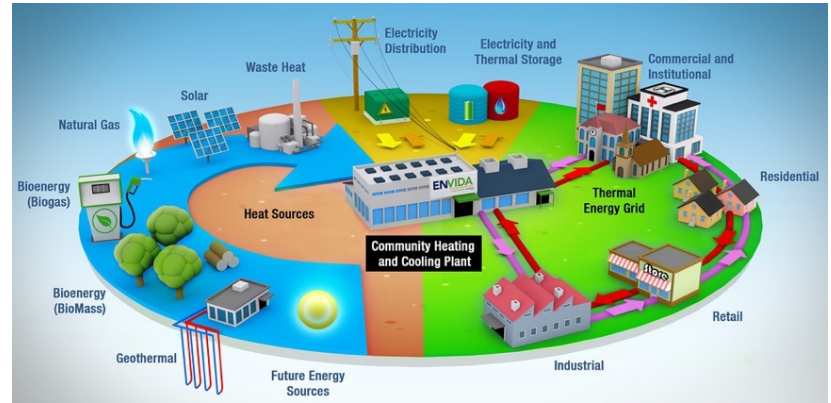


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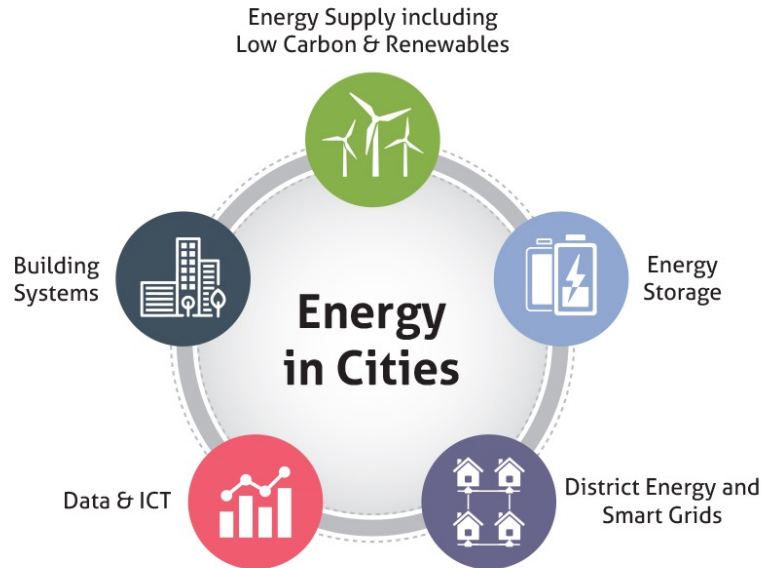
Efficient Buildings – Clean electrification and decarbonization – Smart Energy infrastructure

Integrated Urban Energy Systems

- Energy conservation
- Energy efficiency
- Energy recovery
- Renewable Energy
- Co- and Tri-generation
- District Energy
- System integration and Energy symbiosis
 - Electricity
 - Heating
 - Cooling
 - Gas
 - Energy storage
 - Municipal wastewater



Challenges and Opportunities



Challenges

- Lack of awareness, and major knowledge and skill gaps
- Lack of Urban/Energy Planning practices
- Skepticism exists – scale, historic failures
- Severe competition from stand-alone solutions
- Lack of regulatory framework and favoring policies
- Front-loaded investment
- Natural utilities often absent

Opportunities

- Huge potential to meet future challenges and achieve carbon neutrality
- Local Smart City and Industry 4.0 initiatives
- IGOs, NGOs and MDBs actively promote integrated urban energy systems
- Technologies available in the region

CAPACITY BUILDING ON SUSTAINABLE URBAN ENERGY DEVELOPMENT

Planning

- Energy planning
- Cooling planning
- Heating planning

District Energy

- District Cooling
- District Heating
- Multi-Energy systems

THANK YOU

Asia Pacific Urban Energy Association

www.apuea.org