Urban Energy for a Carbon Neutral Future

Asia Clean Energy Forum 2021

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IIEC
International Institute for Energy Conservation
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:

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<tr>
<th>Region</th>
<th>Country</th>
<th>Year</th>
<th>Status</th>
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<tr>
<td>Asia</td>
<td>China</td>
<td>2060</td>
<td>Policy position</td>
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<td></td>
<td>Japan</td>
<td>2050</td>
<td>Statement of intent</td>
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<td>Kazakhstan</td>
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<td>Submission to UNFCCC</td>
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<td>Singapore</td>
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<td>South Korea</td>
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<td>Oceania</td>
<td>Australia</td>
<td>2050-2100</td>
<td>Pledged towards Paris Agr.</td>
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<td>Fiji</td>
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<td>New Zealand</td>
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<td>Europe</td>
<td>Denmark</td>
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<td>Finland</td>
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<td>France</td>
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Systemic efficiency

Urbanization – Growing population – Climate change

Efficient Buildings – Clean electrification and decarbonization – Smart Energy infrastructure

Source: ABB
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

- 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