

Sectoral Roadmaps 2030: Renewables for Manufacturing Industry and Cities

IRENA Council Meeting, Abu Dhabi
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IRENA's roadmaps



IRENA Roadmap

- Many existing roadmaps
 - IEA technology roadmaps
 - Various country (US, Japan) and regional (EU) roadmaps
 - Roadmaps by industry associations
- Goal is to complement existing work and avoid duplications
 - IRENA has a sectoral approach (instead of technology approach)
 - Global reach including non-OECD countries
 - System perspective regarding renewable energy technologies
 - Emphasis on end-use sectors, starting with cities and manufacturing industry

Roadmap outline

- Present status analysis
 - Formulation of vision
 - Identify multiple pathways to achieve objective
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- Stimulate dialogue among different stakeholders
 - Identify prospects, technological barriers, financing, and development and policy needs
 - Develop action agenda (Timeline, milestones, MRV system)
 - Create synergies among different regional and national efforts



Current status



Renewables in Industry

- Manufacturing consumes 1/3 of final energy consumption
- Accounts for large percentage (up to 46%) of GDP in selected countries
- Industrial energy use is expected to grow with 33% to 2035, while use of renewables remains around 8-9%

- Renewable energy can be the economic solutions today
- CO2 emissions reductions will require renewables
 - Energy efficiency is important but not sufficient
 - CCS development is disappointing
 - Little attention for renewables
- Electrification with renewable power

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The potential for renewable energy in industrial applications
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<p>ARTICLE INFO</p> <p>Article history: Received 20 April 2011 Accepted 27 August 2011 Available online 23 September 2011</p> <p>Keywords: Renewable energy Industrial applications Process heat Solar thermal Biomass Heat pumps</p>	<p>ABSTRACT</p> <p>To date, insufficient attention has been paid to the potential of renewable energy resources in industrial applications. Our analysis suggests that up to 21% of final energy demand and feedback-use in the manufacturing industry sector could be of renewable origin by 2050, a five-fold increase over current levels in absolute terms. This estimate is considerably higher than other recent global scenario studies. In addition, if a 20% share of renewables in power generation is assumed, the share of direct and indirect renewable energy use rises to 31% in 2050. Our analysis further suggests that biomass and biofuels can constitute three-quarters of the direct renewables use in this sector by 2050. The remainder is mostly evenly divided between solar heating and heat pumps. The potential for solar cooling is considered to be limited. While low-temperature solar process heat can reach cost-effectiveness today in locations with good insulation, some biomass applications will require a CO₂ price even on the longer term. Biomass feedstock for synthetic organic materials will require a CO₂ price up to USD 100/t CO₂, or even more if embedded carbon is not considered amongst in CO₂ accounts. Future fossil fuel prices and biomass</p>
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Brussels workshop



Workshop output

- Technology options:
 - Waste and drop-in feedstocks ('12-'20), Dedicated crops ('20-'30), Algae ('30 –)
- Opportunities and barriers:
 - Oil and gas
 - Regional specificity
- Action items:
 - R&D along supply chain
 - Cascading use of biomass / Waste regulation / Trade barriers
 - Labelling (inclusion of externalities) / education

Renewables in Cities

- Cities account for 75% of global final energy consumption
 - Cities not only adapt to climate change, they can actively manage their energy use
 - A unique level of policy and decision makers
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- In certain applications and locations renewable energy is the most economic solution today
 - Significant CO₂ reduction worldwide will also require reductions in cities
 - Energy efficiency is a priority
 - Renewables have not yet received a lot of attention

Bonn workshop



Workshop output

- Renewable energy goes hand in hand with energy efficiency
- Need for data on energy use, especially small- and medium-size towns in developing countries
- Consider key role of technology in context of regional differences
- Monitoring, reporting and verification of ‘sustainability’ of renewable energy
- Creation of innovative finance mechanisms
- Focus on enabling factors for renewable energy
 - What key factors can city governments/governments/suppliers influence?

IRENA smart grids and storage roadmap

- Project for 2012-2013
- Goal of this roadmap is to assess how enabling technologies can be applied for higher shares of renewable power
- Experience so far shows that in many cases high shares (25%+) can be reached without operational problems (eg Spain)
 - Dependent on supply and demand characteristics
 - Even higher shares will require additional measures incl. smart grids
- Developed and developing countries
- Special attention for islands

Regional and country roadmaps

- Engagement in Tonga roadmap
- Request for Nauru roadmap
- Need for Pacific roadmap



His Majesty's Government of the Kingdom of Tonga

TONGA ENERGY ROAD MAP 2010 - 2020

A TEN YEAR ROAD MAP TO REDUCE TONGA'S VULNERABILITY TO OIL PRICE SHOCKS AND ACHIEVE AN INCREASE IN QUALITY ACCESS TO MODERN ENERGY SERVICES IN AN ENVIRONMENTALLY SUSTAINABLE MANNER



Future direction



Value of current approach

- End-use applications
- Global
- Systemic view of renewable energy technologies

- Global renewable energy roadmap
 - Sectoral roadmaps (cross cutting)
 - Input from technology briefs
 - Input from regional scenarios and strategies

Future direction of roadmaps?

- New sectoral roadmaps (cross cutting)
 - Agriculture
 - Tourism
 - RE solutions for traditional biomass

- Regional and country roadmaps
 - Framework
 - Country engagements

Thank you !

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