

Second International Forum
Long-Term Energy Scenarios for the Clean Energy Transition
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Session 2: Exploring the global landscape of
LTES narratives and assumptions



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Achieving the Paris Climate Agreement Goals

Global and Regional 100% Renewable
Energy Scenarios with Non-energy GHG
Pathways for +1.5°C and +2°C

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What are the narratives used by different national governments in LTES?

LTES are currently the domain of international organisations (IPCC, IEA, IRENA + NGO's) But: How many national governments actually have LTES?
A small sample from NDC's submitted to UNFCCC :

1. Switzerland: The term “Renewable Energy” does not appear in the NDC. “Today, Switzerland emits around 0.1% of world’s emissions”; **Cost-efficient mitigation potential and abatement costs are a core aspect** in considering a fair contribution of a country.
2. Viet Nam: “Viet Nam’s INDC identifies the GHG reduction pathway in the 2021-2030 period. With domestic resources GHG emissions will be reduced by 8% by 2030 **compared to the Business as Usual scenario(BAU)**. The above-mentioned contribution could be increased up to 25% with international support.” Viet Nam introduced targets for energy efficiency as well as renewables. However, no focus on renewables only for generation technologies.
3. Australia: “Australia has additional policy measures in place to promote the deployment of renewable energy and improve energy efficiency.” Suggests targets for RE and EE. “100 per cent of greenhouse gas emissions and **removals** in Australia’s national greenhouse gas inventory”.
4. Saudi Arabia: “The actions (...) seek to achieve mitigation co-benefits ambitions of **up to 130 million tons of CO2eq avoided** by 2030 annually through contributions to economic diversification and adaptation. These ambitions are contingent on the Kingdom’s economy continuing to grow with an increasingly diversified economy and **a robust contribution from oil export revenues to the national economy**. It is also premised on the fact that the economic and social consequences of international climate change policies and measures do not pose disproportionate or abnormal burden on the Kingdom’s economy.”
5. Costa Rica: “The VII National Energy Plan 2015-2030 defines energy efficiency and distributed generation as priorities. The hopeful goal of this contribution is to achieve and maintain a **100% renewable energy matrix by 2030**. The increase in energy efficiency in residential and industrial consumption will result in a reduced electrical demand from these sectors. On the other hand, we anticipate an increase in electricity consumption in the transportation sector.”

There is a need to connect the dots between LTES narratives and NDCs narratives.

What are the key technology and policy trends required/expected in the long-term for carbon-neutral energy systems by mid-century?

Key technology trends - required:

- Renewable energy generation driven – focus on PV and On- and Offshore Wind (power) and solar/geothermal (heat)
- Trend towards increased electrification in transport and heat (incl. storage concepts)
- Strong efficiency component

Key technology trends – expected:

- “Technology-neutral” as a entry point for unproven technologies (e.g. CCS or fusion) or proven un-economical technologies (e.g. nuclear)
- “Bridge-Technologies” to prevent real energy systems transition (e.g. “blue H₂” aka “CCUS-H₂”)

Key policy trends – required:

- Binding **national** RE targets with a subset of regulations – especially for grid access and priority dispatch
- Ever evolving technical energy efficiency standards and building codes
- Binding **sectorial** CO₂ and RE targets
- Long-term strategic decisions for specific energy pathways to start implementing infrastructural changes
- Fossil-Fuel Phase-out laws for coal, oil and gas in order to wind down this industry sector in an orderly manner (>> “just transition”)

Key policy trend – expected:

- Discussions about Carbon prices and expected (negative) social impacts
- “Technology neutral” and “market driven” policies which include subsidies for uneconomic fossil and nuclear industries
- Efficiency focused on voluntary lifestyle changes instead of mandatory technology changes.

How are the global trends reflected in the national LTES?

- Global market trend towards PV and Wind – most LTES still include niche technologies (CCS) or uneconomic technologies (nuclear)
- Global vehicle market trend towards electric mobility – LTES often do not reflect this clear trend
- Lack of system analysis: high pv/wind shares won't allow the integration of inflexible “base-load” generation
- Storage uptake – mainly batteries – still under-represented in LTES.

How can global LTES be reconciled with national level LTES to comply with the Paris Agreement goal of a below 2C temperature rise by the end of the century?

- Integrated models which take natural carbon sinks (e.g. forests) into account
- Define national carbon budgets
- Define regional and sectorial energy- and carbon intensity targets

What are the key divergences between LTES produced by energy-oriented institutions and the scenarios produced by the climate community?

1. Energy orientated institutions
 - do not define technology-based targets (“carbon-neutral”)
 - Do not suggest phase-out dates for coal, oil and gas
 - Use more “bridge technologies”
 - Cost projections for renewables often too high
2. Climate community
 - Focus on market ready technologies (renewables and efficiency)
 - Define clear dates for the phase-out of specific technologies
 - No vested interests in technologies and therefore unideological
 - Cost projections for efficiency often not included

Where is the reconciliation of narratives and assumptions needed?

1. For NDCs
2. For long-term infrastructure plans such as electrical grids and EV charging
3. Cost estimations for various generation technologies
4. Cost estimations for various efficiency measures
5. Cost estimations for fuel costs

Thank you

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Presents robustly modeled scenarios to achieve 100% renewable energy by 2050

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