Planning with net-zero scenarios

Moving from political ambition to country-level pathways

Date/Time: 17 December 2020 15:00 - 17:30 CET

Location: Virtual

Background

The International Renewable Energy Agency (IRENA) and the United Nations Framework Convention on Climate Change (UNFCCC) bring together global leaders and experts to discuss the importance of Long-Term Energy Scenarios (LTES) in guiding ambitious climate objectives and how to better align LTES with Paris Agreement targets through Long-term Low Emission Development Strategies (LT-LEDS).

The 'Special Report on Global Warming of 1.5 °C' published by the Intergovernmental Panel on Climate Change (IPCC) in 2018 delivered an important and timely message: the world needs to reach net-zero carbon emissions by 2050 to limit global warming to 1.5°C and limit negative impacts on global ecosystems. Since then, a number of national governments as well as sub-national governments announced to set a time-bound goal to achieve net-zero. In parallel, UNFCCC had set a mechanism – in accordance with Article 4, Paragraph 19 of the Paris Agreement – for its parties to formulate and communicate long-term low greenhouse gas emission development strategies (LT-LEDS, or LTS for short) to operationalise the carbon neutral vision stipulated by the Paris Agreement. To date, 19 countries have submitted LTS to the UNFCCC and many more submissions are expected by the next COP26 in Glasgow. Long-term energy scenarios (LTES) are effective tools for policy makers to agree on how to achieve ambitious goals. While LTES have been used for decades to guide energy policy, the great energy and socio-economic transformation that the net-zero emissions target entails pushes the boundaries of LTES further.

IRENA, through its LTES Network and CEM LTES campaign, is facilitating dialogue among energy planners and modellers in the government sector who develop and use scenarios. These discussions highlighted that, for the LTES to be truly effective in informing decarbonisation pathways, some of the emerging misalignments between national LTES and global climate scenarios need to be addressed. They include, for example:

- Energy and climate policy planning processes.
- Carbon budgets at sub-national, national, and global level.
- Role of renewable energy and its technical representations in the underlying models (geo-spatial and temporal resolutions).

- Definition of carbon neutrality and the role of carbon sinks, carbon removal and carbon leakage for net-zero targets.

This dialogue event brought together the LTES community and the climate scenario community to discuss how the scenario community at large can better elaborate net-zero strategies at a national level, through better alignment of LTES and LT-LEDS.

Key Takeaways

- **Setting ambitious targets, backed by domestic law, is critical for driving climate action across government.** Additionally, climate considerations need to be central not only to energy policy but also to policy across the spectrum, especially concerning growth, economic, and industrial policy. It's important to have pathways for net-zero emissions adapted to individual countries and regional circumstances. These pathways should focus on actions needed in the short term.
- **To be effective in using modelling tools for the energy transition, it is important to combine energy and climate modelling.** Exploring possible pathways and implications can bring a broader systems view to connect the dots between long-term energy scenarios and low emission development strategies, and there needs to be a two-way communication between longer-term energy plans and long-term strategies. Government planning at the sub-national level in terms of urban, transport, and economic planning needs to be integrated into long-term energy strategies.
- **Designing policies, regulatory frameworks, and long-term energy scenarios requires engaging actors in industry, the private sector, NGOs, and other public ministries.** Scenarios require consensus building and a strong technical foundation, as well as a clear and transparent development process.
- **Capacity-building needs to be prioritised for countries without the necessary tools for long-term strategy development.** Many countries with aspirations to go for net zero are not even starting the work on long-term strategies. It's critical to provide these countries with the planning tools to explore what net zero might mean for them and link this to sectoral and infrastructure development plans.
- **It is essential to ensure a just transition for those that will be the most adversely impacted.** The communities that are going to be most adversely impacted need to be brought into the scenario and policy dialogues.

Speakers – Opening remarks, special address, and keynote presentations

Francesco La Camera
Director-General, International Renewable Energy Agency

Ovais Sarmad
Deputy Executive Secretary, UNFCCC Secretariat

Teresa Ribera
Deputy Prime Minister for Ecological Transition, Spain

Priyadarshi Shukla
Co-chair of Working Group III, Intergovernmental Panel on Climate Change (IPCC)

Dolf Gielen
Director, Innovation and Technology Centre, International Renewable Energy Agency

Speakers Panel Discussion 1: National experience, integrating energy and climate perspectives

Asami Miketa
Senior Programme Officer, Innovation and Technology Centre, IRENA

Tim Lord
Director, Clean Growth, Department of Business, Energy and Industrial Strategy (BEIS), United Kingdom

Carlos Barria
Head of the Studies and Policies Division, Ministry of Energy, Chile

Hans van Steen
Acting Director on Renewables, Research, Innovation and Energy Efficiency, Directorate General for Energy, European Commission

Speakers Panel Discussion 2: International experience with net-zero scenarios, aligning long-term low emission development strategies (LT-LEDS) and long-term energy scenarios (LTES)

Elizabeth Press
Director, Planning and Programme Support, International Renewable Energy Agency

James Grabert
Director - Mitigation, UNFCCC Secretariat

Kelly Levin
Director of Tracking and Strengthening Climate Action, World Resources Institute

Richard Baron
Executive Director, 2050 Pathways Platform

Opening remarks, special address, and keynote presentations

Francesco La Camera (IRENA) highlighted in his opening remarks that decarbonising energy is essential to keep global temperature rise below 1.5 degrees Celsius, and a fundamental pillar for achieving net-zero emissions will involve strategic planning that integrates country-specific

considerations. An increasing number of countries are committing to emissions reductions from mid-century onward, and the net-zero approach is gaining traction among cities, companies, and regions. Achieving these goals will require clarity of vision and sound strategies tailored to national circumstances, ensuring an orderly transition where no one is left behind. Long-term scenario networks offer a global platform for scenario developers and planners to exchange experiences in improving long-term scenarios. Raising global climate ambitions necessitates aligning long-term managed scenarios with the objectives of the Paris Agreement and climate strategies stipulated in the indices. The energy and climate communities must collaborate towards sustainable prosperity.

Ovais Sarmad (UNFCCC) stressed that achieving a net-zero carbon emission state is critical, requiring collaboration between the energy and climate communities. Success hinges on urgent action, fulfilling the Paris Agreement, establishing strong Nationally Determined Contributions (NDCs), and advancing the shift from fossil fuels to renewable energy. By the following year, approximately 65% of global carbon emissions and 70% of the world's economy are expected to be under net-zero emissions or carbon-neutrality commitments. Pandemic recovery plans should prioritise a renewable energy transition by incorporating long-term clean energy goals, supportive policies, and market incentives into national climate action plans and NDCs. Countries should integrate long-term low greenhouse gas emissions development strategies (LT-LEDS) into their climate action to contextualise NDCs within long-term planning, inform political and economic cycles, and assure the private and investment sectors.

Long-term energy scenarios can inform energy sector targets, NDCs, and national policy pathways toward net-zero emissions, but require clear implementation roadmaps. Clarity can enhance emission reductions in the energy sector while building climate action and encouraging private sector and investment community involvement. Enhanced engagement between climate change and energy policymakers is essential for aligning efforts, aided by a long-term strategy network to ensure attention to detail and a shared understanding of pathways.

Teresa Ribera (Spain) advocated in a special video address for combining climate and energy agendas, as well as their planning tools, as a key action to responding to main challenges and identifying opportunities. Combining climate, environment, energy, industry, innovation, and research leads to a more sound understanding of challenges and barriers. Integrating energy and climate in scenarios helps design energy policies as well as climate adaptation and resilience initiatives, providing a good understanding of social challenges and risks.

The analysis of decarbonisation pathways resulting from long-term scenarios allows mapping opportunities, challenges and barriers, grounds discussion, and identifies sound solutions for researchers and investors. This provides a tool to identify how to create prosperity, recover economies, create employment, and provide for social demands should be consistently responded to, taking into consideration IPCC alignments, commitments to the international agenda, and references to equity and justice.

Priyadarshi Shukla (IPCC) delivered a keynote speech in which he painted a picture of the latest global climate insights. From about 1850 to 2020, human emissions have increased the temperature by about 1.5 degree centigrade, with 1.2 degrees above pre-industrial levels in 2020. The remaining space to achieve net-zero is shrinking, and emissions have to fall down at a very high speed to relegate emissions in the zone of 2040 to 2055. It is not only carbon dioxide that requires targeting for mitigation but also other greenhouse gases like methane and nitrogen oxide.

There is significant damage even at the level of 1 degree in temperature rise, so at 1.5 degrees there would be huge damage taking place in different natural and human systems. When designing long-term scenarios, it can be difficult to have multiple scenarios which would not cross the 1.5-degree target. There are discussions regarding overshoot scenarios where emissions overshoot and the global temperature rises above 1.5 degrees for some time, after which emissions decrease and the temperature is brought below 1.5 degrees again. Delays in mitigation efforts would mean that approximately something of the order of about 220 gigaton of CO2 removals would be needed to address an overshoot of 0.15 degrees.

Dolf Gielen (IRENA) presented on the lessons learnt on long-term energy planning from the Long-Term Energy Scenarios (LTES) Network. While there is clarity on the long-term goal of decarbonization by mid-century and political commitment, it is not yet clear how to achieve it, and scenarios and models to develop these scenarios will play a critical role in operationalizing that. Within the framework of the LTES Network, a diverse set of countries have engaged to look at how to enhance scenarios for energy transition, how to enhance the use of these scenarios for policymaking, and how to improve the institutional capacity building for energy scenario use and development. Key aspects include the importance of good governance of scenario development, the need to expand scenario boundaries, the need to be clear about the purpose of the scenarios and the transparency of the process, and to build the right type of scenarios and scenario-building capacity within governments.

Panel Discussion 1: National experience, integrating energy and climate perspectives

Tim Lord (UK) highlighted the critical importance of ambitious targets in the first panel discussion of the webinar, noting the UK's net-zero target, interim carbon budget, legislative budgets, and increased ambition of their Nationally Determined Contribution (NDC). Domestic law is in place to enforce these targets and has been critically important in terms of driving action and making sure there's a priority across government. Lord stressed that climate should be central not only to energy policy but also to policy across the spectrum, particularly to growth, economic, and industrial policy, because the opportunity to build back better and greener from coronavirus is a unique one. The growth opportunities from the low-carbon transition have been central to climate policy, and climate policy is becoming central to growth.

He noted the importance of a just transition and how to manage that transition, particularly for regions highly dependent on fossil fuels, as critical to political and social consent for the pace of

transition. Pathways for net-zero adapted to individual countries and regional circumstances are critically important in terms of identifying how to get there and key short-term choices. Most pathways have a lot in common in terms of the action needed now, and retaining a strong focus on what needs to be done in the next 1-10 years as the critical outcome. The key challenge for the UK is translating targets into actions that fit both the requirements in energy and climate terms, but also fit with industrial and economic capabilities.

Lord stressed the importance of systems thinking in developing pathways and noted that while the UK has cut emissions by almost half since 1990, the net-zero transition in the next 30 years will require systemic change. A new energy white paper addresses not just key technologies and investment models, but also how different parts of the energy system interact with one another.

On the topic of recommendations, Lord suggested that having an independent credible advisory body has been critically important to the debate in the UK. He also said that the energy transition has net-zero at its heart, but it's not just about net-zero, and the energy challenge and the transition to net-zero can potentially happen at the same time as an energy transition which is a hugely positive proposition for consumers and energy users.

Hans van Steen (DG ENER, European Commission) stressed the importance of long-term energy scenarios because of the strong connection between energy and climate, and they played a really important role in the targets which the EU has set for 2030 when it comes to renewable energy and energy efficiency. Without long-term scenarios, the EU would never have been able to convince 28, and soon 27, governments to sign up to do important new policies and targets for renewable energy.

It is very important to look at energy and climate together and how this involves sectors outside of energy, such as forestry, biodiversity, and the use of bioenergy. Combining energy and climate modelling is essential, and a team of people from across different departments should be involved in this type of operation. It is also essential to look at how consumer behaviour impacts energy consumption, which can be done with modelling operations. Modelling should be a continuous process, and data should be updated regularly, including data related to the cost of renewables. It is important to think about what the modelling is being used for, for example, to assess long-term objectives for climate neutrality in 2050 and to show the technical and socio-economic feasibility of different ways of decarbonizing economies.

Continuous engagement with stakeholders is needed so stakeholders can provide their views and information about data and be informed about the modelling results. The EU reviews scenarios regularly with the member states to create trust, a common understanding, and a common baseline for future energy and climate planning. It's good to have independent analysis because many stakeholder groups will present their own scenarios and results, and it's important to have an evidence base from which to compare the different inputs received. When designing policies, the European Commission takes care to listen to the industry, the private sector, NGOs and other public ministries, and work very closely with them to share assessments

and analysis. Collaboration and engagement are key to energy policy, since the energy transition and climate commitments are for the people. It is necessary to have a very clear process, be very transparent and involve stakeholders as far as possible to create trust and ownership.

Carlos Barria (Chile) introduced practices from Chile's long-term energy planning process. When designing policies and regulatory frameworks and long-term energy scenarios, Chile gets input from the industry, private sector, NGOs, and other public ministries, sharing assessments and analysis to improve decision-making and engage all parties. Robust scenarios require consensus building from many parties and a strong technical foundation. Chile has an energy planning process that it built with participation with the generation companies, the utilities and transmission operators, the ISO, the mining industry, and the overall industry with energy consumption. The design of the participation process is in regulation, and Chile has rules of participation and creates task forces with energy experts, academics, and NGOs. The energy planning process is an open process, and it designs and simulates scenarios with strong technical approaches that are shared, asked about, and listened to.

Panel Discussion 2: International experience with net-zero scenarios, aligning long-term low emission development strategies (LT-LEDS) and long-term energy scenarios (LTES)

James Grabert (UNFCCC) identified the role of long-term scenarios, governance frameworks, and policy peer learning as key success factors in the second panel discussion of the webinar. He suggested stakeholders should consider long-term scenarios as informing them and helping them foresee the long-term implications of decisions made today. Sector-level scenario planning is really important in identifying the technologies, investment needs, and the policies and supports needed for the social economic transition issues. Innovative policy and business practices will arise in multiple areas to deal with and reconcile the short-term costs and align with long-term benefits. The UNFCCC is planning to provide further support to countries through regional collaboration centres to develop and implement their long-term strategies and enhance the sector level mitigation.

The energy sector has the technologies, tools and capacities to move towards net zero emissions before 2050. Grabert noted that governments are starting to invest in new technologies, and some are looking at hydrogen. Cooperative approaches that are defined in the Paris Agreement should help in moving the energy sector towards net zero emissions. Developed countries are moving, and the rest of the world will move because energy is something that is part of a global market.

The COVID-19 recovery period can be used as an opportunity to for countries to align their energy plans to the goal of net zero emissions. Government planning at the sub-national level in terms of urban, transport, and economic planning needs to be integrated into long-term energy strategies.

Kelly Levin (World Resources Institute) stressed the importance of bringing together long-term energy scenarios and low emission development strategies. Exploring possible pathways and

implications can bring a broader systems view to connect the dots between these two planning processes. There needs to be a two-way communication between longer-term energy plans and long-term strategies. It is really critical to make sure that we're bringing a review process into the long-term strategy as well as into the long-term energy planning.

There is tremendous momentum around net zero targets at the country, subnational, and corporate level. It's going to be really critical that net zero targets translate to greater ambition in the shorter term. In terms of the energy sector specifically, there are a few key attributes that we know in terms of what a net zero target a pathway would look like: 1) There are significant needs for electrifying industry, and 2) the share of low carbon fuels in the transport sector needs to jump up significantly by 2030 and 2050.

These are some tremendous accelerations, but the good news is that we know we this can happen. There is an opportunity here also from a governance perspective to bring processes together. It is important to do modelling and analysis that shows both the benefits and the significant losses if we don't take these conversations together. Model-based analysis is essential for showing the implications of different scenarios on different jobs, as well as costs or prices, and communicating that transparently and then using those in stakeholder dialogue with those that are most adversely impacted. The public sector needs to work hand in hand with those affected to design those measures to ensure a just transition.

Richard Baron (2050 Pathways Platform) focused on the progress that countries are making with their climate strategies towards 2050, as many countries with aspirations to go for net zero are not even starting the work on long-term strategies. It's critical to provide countries with the planning tools to explore what net zero might mean for them and link this to policy or infrastructure development plans. Long-term strategies should be thought of as processes, not documents, and should be updated with new information, such as surprises on cost or new technologies. It will be quite critical to work on the robustness of the scenarios once countries decide that this is the way they want to go.

The net zero commitments are becoming strong signals, and countries that are not quite there yet see that their major export markets are going in this direction and have to somewhat adjust the tone of their economy and their future investment and sexual development towards what future markets hold for them. It is important to grab the signal that net zero commitments are becoming stronger and recognise that making investments in fossil fuels is not a well-spent investment. The net zero objective must be made more visible, while still recognising that for some countries, this is not a goal that they can embrace now as they still have a lot to do on their development and on the recovery in particular. For new investments, it's the duty of development banks to ensure they're fully aligned with what seems to be recognised as the right response to the climate emergency, which is net zero.