Fifth International Forum on Long-Term Energy Scenarios (LTES) for the Clean Energy Transition

September 9 – 11, 2024| Hybrid Event

Day 1 Event Proceedings

Event summary

The 5th LTES Forum hosted approximately 40 attendees at IRENA Innovation and Technology Center offices in Bonn, Germany, while 100 people participated in the Forum online. The participants represented a diverse array of stakeholders, such as government officials, intergovernmental organisations, development partners and non-profit organizations. The Forum focused on alignment between energy and climate planning, the role of scenario planning for de-risking investment for the clean energy transition, scenario communication, lifestyle changes, energy security, and hydrogen integration. Through presentations, panel discussions, and attendees' interventions the Forum facilitated the exchange of knowledge and experiences on different aspects of the planning of LTES.

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Day 1 Overview

Session 1

- Scenario-based energy planning was identified in the discussion as a critical tool for financial institutions in assessing risks and identifying climate investment opportunities. Participants emphasized that credible, nationally owned long-term scenarios help align stakeholder expectations and inform financing decisions.
- Country representatives and development banks highlighted the importance of integrated planning frameworks that link generation, transmission, and finance sectors. They noted that coordination across ministries and planning timeframes may contribute to improving project bankability and aligning public and private investment flows.
- Multilateral development banks highlighted that national energy and climate plans influence their financing decisions. Speakers from the IDB and World Bank noted they consider scenario-informed plans when identifying investment pipelines, which the World Bank representative referred to as potential 'no regret' investments.

Session 2

- The discussion highlighted the necessity of involving stakeholders during the modelling process and sharing assumptions and limitations early on in the process, in to final results and reports generated. Sharing preliminary results and engaging stakeholders can help incorporate broader perspectives into models and can lead to greater buy in.
- It is vital to communicate the limitations in models, uncertainties and assumptions used when sharing modelling results and scenarios with stakeholders. This transparency can build trust and more effective engagement.
- To effectively communicate with policy makers, it is impactful to use clear and concise language and limit submissions to 1-2 pages to ensure maximum engagement.

Session 3

- Governments are encouraged to ensure alignment between global climate commitments and national energy planning while ensuring cohesion between short to medium term planning and long-term planning.
- Good communication and stakeholder engagement during planning contributes to proper alignment between energy and climate planning, as these practices build consensus.
- Inter-ministerial coordination is a critical factor for developing comprehensive modelling and achieving proper energy and climate planning alignment.

Session 1 Roundtable (Co-hosted with Brazil): Leveraging Long-Term Energy Scenarios (LTES) to Attract Investments – Bridging Planning and Funding for Energy Transitions

Moderator: *Elizabeth Gillespie,* Director, Financial Services, Ernest & Young (EY)

Scene setting:

- *Asami Miketa,* Head of Energy Planning and Power System Transformation, IRENA
- *Gustavo de Naciff Andrade,* Deputy Head of Energy Economics, EPE, Brazil

Session Objective: This session explored how long-term planning frameworks can be tailored to mobilize national and international climate funds and how they can be used to attract significant financial resources, ensuring that the countries' energy transition strategies are integrated with global climate objectives.

Key Takeaways:

- Scenario-based energy planning was identified in the discussion as a critical tool for financial institutions in assessing risks and identifying climate investment opportunities. Participants emphasized that credible, nationally owned long-term scenarios help align stakeholder expectations and inform financing decisions.
- Country representatives and development banks highlighted the importance of integrated planning frameworks that link generation, transmission, and finance sectors. They noted that coordination across ministries and planning timeframes may contribute to improving project bankability and aligning public and private investment flows.
- Multilateral development banks highlighted that national energy and climate plans influence their financing decisions. Speakers from the IDB and World Bank noted they consider scenario-informed plans when identifying investment pipelines, which the World Bank representative referred to as potential 'no regret' investments.

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Elizabeth Gillespie (Director at Ernst & Young (EY)) shared examples illustrating how private sector banks use scenario-based planning to forecast potential financial losses under varied conditions, identify sector-specific risks and opportunities, and assess counterparty transition plans. She highlighted the growing trend among banks, especially in the UK, of customizing scenarios to reflect their outlook on global economic and climate trajectories. These scenarios are being used to reevaluate portfolio exposures and intermediate net-zero targets. Gillespie observed that while many banks remain cautious about financing emerging technologies such as hydrogen and renewables, they are actively seeking ways to improve risk mitigation. She suggested that credible, plausible energy scenarios can serve as valuable inputs to help financial institutions extend climate-related financing. She also emphasized the importance of collaboration between the finance and energy sectors to explore practical solutions for scaling up investment.

Gustavo Naciff de Andrade (Brazil's Energy Research Office (EPE)) emphasized the critical need for increased investment, referencing studies by IRENA and the IEA that indicate a substantial financing gap, particularly for emerging economies. To address this, the G20's Energy Transitions Working Group (ETWG) has developed a consensus that energy planning can enhance investment in clean energy by creating transparency, consistency, and alignment with climate goals. According to the speaker from Brazil's EPE, robust energy planning frameworks can build trust in the energy transition, and help de-risking investments by providing stakeholders with predictability and clear long-term goals. He highlighted the formation of the proposed Global Coalition for Energy Planning, a voluntary alliance aims to advance global energy planning, with Brazil proposing IRENA as the coalition's initial secretariat due to its expertise in this area. The coalition would rotate leadership every two years, with leading countries hosting a planning summit to guide strategic priorities. The coalition's day-to-day activities would be overseen by a geographically diverse board of 15 representatives to ensure inclusivity. The coalition's draft action agenda focuses on critical areas, including transmission and distribution grid planning to integrate renewables, scenario modeling, and communication strategies, as well as integrated energy and mining planning to scale supply chains for strategic minerals.

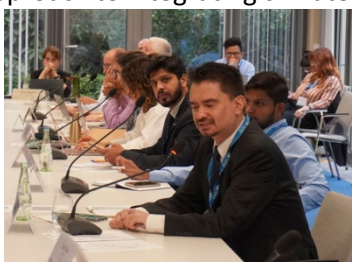
Asami Miketa (International Renewable Energy Agency) noted that long-term planning can foster a favorable investment environment by aligning stakeholders, avoiding costly mistakes, and providing consistency in policy direction, which reduces risks for investors in energy transition projects. She noted that proper energy planning accelerates project implementation and provides a systematic framework to handle unsolicited proposals and prevent short-term, expensive fixes.

Asami highlighted IRENA's ongoing efforts to connect energy planning and investment, including the Global Network on LTES Energy Planning Frameworks for Mobilizing Finance for the Energy Transition webinar series on mobilizing finance, which began in 2023 and is set to culminate in discussions at the Clean Energy Ministerial (CEM). Additionally, Miketa mentioned the IRENA A Just and Inclusive Energy Transition in Emerging Markets and Developing Economies: Energy Planning, Financing, Sustainable Fuels and Social Dimensions report documenting good examples of energy planning frameworks that facilitate investment, such as those in Brazil, Costa Rica, the Philippines, El Salvador, and Italy. Further, Asami shared preliminary findings from IRENA's assessment of over 50 national energy and climate planning documents, which revealed promising trends in integrating financial information into energy plans. Asami underscored the importance of ongoing work to refine energy planning frameworks, contributing to enhanced financial mobilization for the global energy transition, particularly in emerging economies.

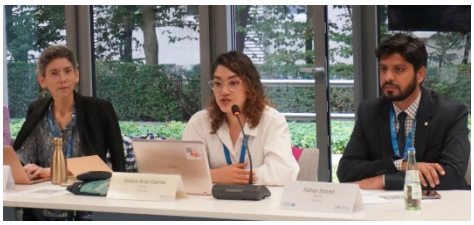
Plenary Interventions

How do countries integrate climate finance criteria into national energy planning to secure funding for clean energy projects?

Francisco Domenech Guzman (Ministry of Energy, Chile) described Chile's approach to integrating climate finance criteria into national energy planning, focusing on creating favorable conditions for private investment in a largely privatized energy market. He explained that the government's role is to establish foundational rules and policies that make it easier for private entities to fund and develop clean energy projects. Chile's efforts include infrastructure improvements, including building transmission and power lines to enable the transfer of energy from geographically advantageous areas, like the solar-rich north and wind-rich south, to central demand hubs. Chile provides public funds for pioneering renewable projects, like the country's first concentrated solar power (CSP) and geothermal plants, to encourage market entry for new technologies.



For long-term planning, Chile has introduced "development poles," which are regions identified as strategic for renewable energy. By clustering renewable projects, Chile aims to streamline connections to the main grid through consolidated power lines by 2030 to link these clusters to the central grid, reducing risk for private developers by securing a stable and accessible route to the energy market. This policy is intended to support Chile's clean energy transition while aiming to bolster investor confidence in renewable projects across the country.



Jessica Arias Gaviria (Mining and Energy Planning Unit (UPME), Colombia) discussed Colombia's progress and challenges in aligning long-term energy planning with climate finance strategies. Colombia's energy transition involves complex dynamics due to its status as a net fossil fuel exporter, which necessitates comprehensive coordination across various government ministries, including energy, environment, finance, labor, and commerce. Colombia's approach aims to establish a framework that incorporates climate finance and renewable energy investments across both energy supply and demand sectors. Colombia has made progress with initiatives like the national green taxonomy and climate finance strategy, alongside plans to reduce fossil fuel subsidies gradually. These efforts are intended to signal a shift toward renewable energy investments and to encourage both private and public funding. Additionally, she highlighted the challenges of communicating the need for a clean energy transition to stakeholders, particularly in light of economic dependence on fossil fuels. To build public understanding and support, she called for assistance from external and independent institutions to help present these plans as essential steps for ensuring Colombia's future economic competitiveness.

Gustavo Naciff de Andrade & Camilla de Araujo Ferraz (Energy Research Office (EPE)Brazil) discussed Brazil's ongoing efforts to develop a national green taxonomy, which builds on the approaches taken by countries like Colombia and Mexico. It was noted that in Brazil, multiple sectors plan with the energy transition in mind for instance the Ministry of Economy, launched an ecological transformation plan, which includes energy transition as a key component. The Ministry of Industry has also introduced a mission-oriented industrial policy focused on energy transition, economic decarbonization, and fostering a bioeconomy. Additionally, the government's Growth Acceleration Plan includes substantial investments

in energy transition projects. The EPE is working closely with different ministries to align their projects with a unified long-term energy vision that supports sustainable development and investment in Brazil's energy transition. **Natacha Marzolf** (Inter-American Development Bank (IDB)) provided an overview of IDB's role in supporting Latin America and the Caribbean's energy transition through a portfolio targeting sustainable development, poverty reduction, and climate resilience. It was noted that while 60% of LAC's electricity is generated from renewable sources there are challenges to further decarbonization, including a need for $150 billion in annual investments by 2030. Additionally, issues relating to energy access persist coupled with high energy costs and significant electricity losses (17% across the region). According to the IDB representative, long-term energy planning is 'fundamental' for identifying investment needs and addressing region-specific issues like long permitting processes and power systems that are not yet optimized for large-scale renewables integration. The role of regulatory frameworks in converting planning into concrete investments through mechanisms like auctions as illustrated in Brazil, Colombia, and Chile was emphasized. The IDB actively supports energy planning in six LAC countries (Bolivia, Brazil, Panama, Dominican Republic, Barbados, and the Bahamas) to mobilize climate finance. The majority of the IDB's portfolio focuses on transmission, distribution, and electrification projects, with climate finance and Paris Agreement alignment covering nearly 90% of their activities. Additionally, the IDB collaborates with key partners, such as the Climate Investment Fund, Green Climate Fund, and European Investment Bank, mobilizing $1.4 billion in co-financing in 2023.

How financial institutions incorporate national energy plan inputs alongside climate finance priorities when making investment decisions.

Claire Nicolas (World Bank) discussed how the World Bank integrates national energy plans with climate finance priorities in investment decision-making. She emphasized the importance of ensuring that national energy transition strategies are developed in consultation with the power sector, including utilities, and are endorsed by key sector stakeholders. This alignment can help avoid the common issue where plans created by ministries in charge of environment, lack integration with the energy sector, which can result in misalignment with long-term decarbonization goals.

Claire explained that national energy plans should ideally be scaled into 5-to-15-year investment pipelines, to instill confidence in private investors by signaling the continuity of renewable projects. The World Bank supports projects that align with an integrated energy plan provide a "no-regret" foundation for energy transition investments, streamlining the due diligence process. In terms of climate financing, the critical role of private sector involvement was underscored, given the substantial investment required for energy transition. The World Bank's financing aims to catalyze private investment, especially in areas like grid reinforcement, storage, and flexibility solutions. Additionally, the World Bank increasingly relies on risk mitigation instruments, such as guarantees, to attract private sector participation without directly investing in assets.

Vivien Foster (Climate Compatible Growth (CCG), UK) discussed the "Data to Deal" framework, a structured approach to mobilizing climate finance developed in collaboration with IRENA and based on successful Latin American models, including Costa Rica, the Dominican Republic, and Uruguay. This framework involves integrated processes from data collection through to financing agreements, aiming to bridge the technical planning by energy ministries with the financial mobilization by finance ministries.

Vivien introduced *MinFin*, an open-source modeling tool developed by CCG which considers investment needs generated from energy planning and projects the financing costs based on a country's historical financing conditions. It assesses whether available cash flows are sufficient to cover these financing costs, highlighting a key principle that financing is contingent on funding. She shared key findings from pilot analyses in ten countries using *MinFin*. Preliminary results suggest that many net-zero strategies may be financially unviable under current fiscal and cash flow conditions. She also noted that improving affordability would likely require a combination of lower financing costs—achievable through concessional finance—and risk reduction. In cases where utilities have insufficient revenue, governments may need to choose between raising tariffs or seeking external support, raising important equity questions around who pays for the transition. Finally, she suggested that comparing net-zero pathways to least-cost alternatives could help clarify the incremental finance needs that international support may be required to fill.

What potential solutions exist for the challenges in aligning energy planning frameworks with climate finance requirements?

Alessia De Vita (GET.transform) highlighted key challenges in aligning energy planning with climate finance, noting gaps in understanding among non-energy stakeholders regarding what the speaker referred to as the 'importance of energy' and the role of energy policy. In many countries energy planning is perceived as a narrow, technical issue therefore energy strategies are often not integrated into broader national strategies. She noted that energy planning involves long-term infrastructure assets, such as PV panels and power lines, that last decades and require substantial upfront investment. These long-lived assets underscore the need for careful, strategic planning and clear cross-sectoral collaboration. In conclusion it was highlighted that all stakeholders, especially non-technical sectors, should be engaged and communicated to the role of energy planning in achieving climate goals.

Andrea Wainer (REN21) provided insights on the gaps and opportunities in global renewable energy deployment, echoing the need for integrated planning and investment alignment. REN21's analysis shows that renewables constitute only 13% of total final energy consumption globally, with renewables in power at about 30%, and much lower adoption rates in sectors like transportation, which sees less than 4% renewable energy penetration. She highlighted the stark regional and sectoral disparities in renewable adoption and investment.

Andrea stressed the need for integrated energy planning that links diverse sectors (agriculture, industry, buildings, and transportation) and harnesses renewables' socio-economic potential—such as job creation, local manufacturing, and community involvement. However, she acknowledged substantial barriers, including significant differences in capital costs between high- and low-income countries. She posed a challenge to policymakers on effectively implementing cross-sectoral, integrated energy strategies to leverage renewables and close the investment gaps, suggesting that holistic and inclusive approaches are essential to driving meaningful progress.

Lucia Fuselli (Climate Strategies Consulting) shared perspectives on climate finance considerations for energy project pipelines, stressing the importance of long-term scenario planning. Lucia noted that a structured approach to climate finance includes strategic decision-making at the national level, sectoral coordination to ensure the integration of relevant sub-sectors to avoid issues such as a surplus of electricity generated without sufficient grid capacity and an enabling context underscored by a stable policy and regulatory environment.

She also shared three key recommendations, first there should be a systematic approach to engagment of financiers starting with multi-lateral lenders to provide a solid funding foundation. Secondly there should be early consideration of risk mitigation tools including guarantees to attract investors. Finally, governments should cultivate a stakeholder-centric approach to planning as it builds investor confidence. In conclusion it was noted that climate financiers value coordinated efforts that align with long-term planning and incorporate socioeconomic and environmental goals, as these are particularly relevant for ESG-focused private investors.

Charlie Heaps (Stockholm Environment Institute) argued that effective energy planning must address both

supply and demand, including conservation and demand-side management—areas that are often neglected due to political sensitivities, especially in democratic contexts. He pointed to emerging trends, such as increased electricity demand driven by large electric vehicles and data-intensive technologies like artificial intelligence, as factors that could undermine progress toward climate goals if left unaddressed. Heaps suggested that current planning efforts may be too narrowly focused on expanding supply, and called for a broader, more integrated approach. In his view, aligning long-term energy scenarios with financing priorities is important, but so is asking how financial institutions might better support the comprehensive scope of long-term planning required to meet climate objectives.

Claire Nicolas emphasized the complexities of using feed-in tariffs (FiTs) as a policy tool, particularly in countries with less developed power systems. She referenced Vietnam's experience, where FiTs led to the rapid deployment of 9–10 GW of distributed photovoltaic (DPV) capacity within a year. This surge, though significant, resulted in over 20% of renewable generation being curtailed due to insufficient transmission and distribution infrastructure. Claire advocated for integrated planning approaches that consider both generation and grid infrastructure development to ensure renewable capacity can be fully utilized. It was proposed that policy tools like auctions, which enable more controlled, phased deployment of renewables, may help align generation with grid expansion timelines, ensuring stability and efficiency in emerging markets.

Alexandra O'Sullivan (Danish Energy Agency) highlighted Denmark's commitment to shifting investments away from fossil fuels through its participation in the Beyond Oil and Gas Alliance. Denmark has pledged to halt all new investments in North Sea fossil fuel extraction and plans to end all oil and gas production in the area by 2050. This policy signals to investors that fossil fuel investments are not only discouraged but also restricted, pushing capital toward green energy projects. It was acknowledged that the recent energy crisis in Europe challenged Denmark's strict goals, leading to a temporary expansion of existing oil fields. Nonetheless, she affirmed that the overarching message remains intact and called on other

countries to join the alliance, adopt similar investment restrictions, and contribute to steering financial flows away from fossil fuels toward sustainable alternatives.

How can Long-Term Energy Scenarios (LTES) be refined to better meet the expectations of climate finance institutions?

Gustavo Naciff de Andrade emphasized the importance of transforming LTES into actionable instruments that attract investment and support emerging technologies. He cited Brazil's success with transmission auctions, which in 2023 attracted $60 billion in investment, as an example of how strategic long-term planning can be effectively translated into market-recognized, financeable projects. It was noted that financing new technologies presents higher risks, as such government and development banks shoulder risks and catalyze private investment. For instance, Brazil's National Development Bank played a pivotal role in establishing Brazil's wind industry by supporting initial auctions and infrastructure, which later attracted private investors.

Gustavo noted the need for targeted instruments that can bridge LTES and the financial sector, enabling investors to support the evolving requirements of the energy sector while ensuring the sustainable growth of new technologies.

Natacha Marzolf (Inter-American Development Bank (IDB)) expanded on the essential connection between long-term energy planning and financing, with a focus on Latin America's renewable energy goals. She cited the region's commitment to the RELAC initiative, which aims for 80% renewable energy by 2030, underscoring that achieving such targets requires thorough long-term planning to establish regulatory frameworks and estimate investment needs.

Natacha gave the example of Chile, where significant renewable energy capacity has established through successful auctions, but the transmission infrastructure has not kept pace, creating bottlenecks that prevent the efficient distribution of generated renewable power. This situation highlights the importance of planning that covers generation, transmission, and distribution to avoid such issues and ensure that renewable energy investments are fully utilized. She emphasized that large-scale projects, particularly in emerging technologies like green hydrogen, require long-term financing that includes concessional financing to reduce costs and mitigate risks for private investors. Having a comprehensive plan with mapped-out investments helps unlock funding opportunities from institutions like the IDB and other partners, which is vital for reaching renewable energy targets.

Francisco Domenech Guzman clarifying that while Chile has experienced rapid growth in photovoltaic (PV) generation, the lag in transmission capacity is less an issue of planning and more a result of Chile's privatized energy market. He explained that in Chile, private companies develop solar PV projects but often must contend with the transmission bottlenecks, as there is no mechanism to restrict generation capacity. Transmission projects, such as the first 3,000 MW direct current line, are underway to address transmission issues. However, he noted that the permitting process is slow, delaying the line's completion until 2029. Due to the extended timeframe required to complete such infrastructure, Francisco emphasized the need to balance ongoing generation with realistic transmission capabilities.

Ilija Batas Bjelic (Institute of Technical Sciences at the Serbian Academy of Sciences) emphasized the value of integrated energy planning, which considers all necessary projects collectively to achieve sustainable

outcomes. This contrasts with the fragmented approach seen in project-specific financing, which may overlook crucial components required for comprehensive energy solutions. By contrasting project-specific financing with integrated planning, the speaker illustrated the role of the latter in achieving sustainability, as it includes 'all the projects you need' for that goal.

Malene Hovgaard (Danish Energy Agency) shared Denmark's proactive approach to addressing transmission bottlenecks by forecasting energy infrastructure needs. Given the common issue that transmission development often lags behind faster-to-build solar or wind projects, the Danish Energy Agency prepares an annual report that outlines both existing planned projects and additional projects anticipated as necessary to meet climate goals through 2050. This report is shared with the national utility company, enabling it to plan infrastructure development in alignment with both confirmed and projected renewable projects. This strategy helps synchronize transmission planning with renewable generation growth, potentially mitigating bottlenecks and ensuring infrastructure readiness.

Francisco Domenech highlighted the need for political and economic stability to attract private investment, noting that frequent policy shifts between administrations creates uncertainty, which can deter investors. He highlighted Chile's experience with freezing electricity prices during a period of social unrest, though intended to stabilize costs for consumers, this policy led to an unsustainable debt for electricity providers, now resulting in an 80% price hike that risks driving consumers away from electricity back to fossil fuels. He underscored the need for consistency and stability in energy pricing and policies to foster a conducive environment for private investors.

Andrea Wainer emphasized the importance of flexibility beyond storage, especially through demand-side management and integration with various end-use sectors which is crucial for enhancing grid resilience. She pointed out that flexibility solutions often involve operational expenditures (OPEX) rather than capital expenditures (CAPEX) costs, which raises unique financing challenges compared to infrastructure projects that are more CAPEX-intensive.

Charlie Heaps highlighted the need to rethink how we define and approach energy planning, especially in light of discussions about transmission constraints in Chile. He suggested that rather than focusing on aligning long-term energy scenarios with financial institutions' needs, the question could be reframed to ask how financing institutions might better support the needs of long-term energy planning. This shift acknowledges the scope of the climate challenge and the limitations of current tools, ultimately an expansive view of energy planning is necessary in the global climate response.

Farhan Ahmed (Ministry of Planning, Development, and Special Initiatives, Pakistan) noted that in Pakistan, over 40% of power generation relies on fossil fuels, creating significant capacity payment burdens for consumers. These costs are exacerbated by long-term contracts with independent power producers (IPPs), which limit flexibility in reducing fossil fuel reliance. For countries like Pakistan, he argued, the key financial need is not solely for new renewable capacity but also for support in transitioning existing fossil fuel plants to renewable energy. This approach relieves some of the financial burdens on consumers while enabling a shift to cleaner energy. It was noted that without specific financing

mechanisms to aid the transition, developing countries may remain locked into high fossil fuel dependencies, unable to scale up renewable energy capacity effectively.

What is the role of private banks in supporting energy transition projects? Is there a need to better align energy planning practices with the interests of the private financial sector?

Elizabeth Gillespie noted that private banks typically focus on shorter-term financial horizons, primarily planning for a maximum of five years, since regulatory requirements mandate they hold capital only to cover near-term risks. Although many banks have publicly committed to net-zero goals, they are now grappling with the implications for their strategies, which might eventually lead to more engagement in forums like this to deepen their understanding of the energy sector. She reiterated the importance of certainty for banks, noting that while banks assess a range of scenarios, they ultimately seek more definitive probabilities. LTES should offer more likelihood-based data including assigned probabilities, as this might better align with the decision-making needs of private banks and encourage their active participation in the energy transition.

Claire Nicolas addressed the growing need for flexibility in energy systems, particularly in developing countries with evolving power infrastructures. She explained that some recent energy auctions bundle renewable generation developments with storage projects to ensure consistent energy delivery to the grid. Claire also highlighted the importance of building the operational capacity of grid dispatchers in less advanced systems on flexible dispatch strategies for hydropower and thermal power plants. Regarding market mechanisms, she noted that countries developing energy markets are increasingly exploring various market models to support the energy transition. In some cases, traditional energy-only markets may suffice, but in others, capacity or ancillary services markets might be needed to ensure grid stability and efficiency. The World Bank is now integrating market model analysis alongside traditional least-cost planning models to provide comprehensive guidance on market design, helping countries establish systems that support long-term flexibility and reliability.

Jessica Arias Gaviria noted that engaging major stakeholders in the dialogue is crucial for advancing Colombia's energy transition. She highlighted the challenges Colombia faces in balancing its energy transition goals with its economic dependence on fossil fuels, particularly oil and coal royalties and resistance from both the private sector and government. It was noted that Colombia's national oil company is now engaged in discussions on energy transition, which may pave the way for diversifying its investment to include renewables.

Natacha Marzolf addressed the financing structure for renewable projects, noting that IDB primarily focuses on capital expenditures (CAPEX) for upfront costs in sectors like solar, wind, and hydro, especially for public sector companies in collaboration with partners such as the Green Climate Fund. She noted that operational expenditures (OPEX) in renewables are generally minimal and are usually covered by tariffs or national budgets. She highlighted the IDB's participation in the Energy Transition Accelerator Facility (ETAF), a platform led by IRENA that connects MDBs, private banks, and development institutions with renewable energy projects. She concluded by underscoring IDB's role in providing financing that fills gaps left by private sector banks, particularly for public sector funding needs.

Session 2 (Co-hosted with the European Commission Joint Research Centre): Incorporating Behavioral Dynamics and Lifestyle Changes into Energy Demand Modeling

Moderator: *Juan Jose Garcia*, Programme Officer, Clean Energy Transition Scenarios, IRENA

Scene Setting Presentation: *Nadeem Goussous*, Associate Programme Officer, Clean Energy Transition Scenarios, IRENA

Panelists:

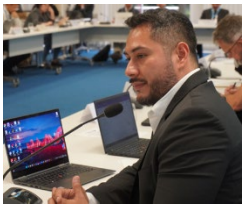
- *Paul Deane*, Senior Research Fellow, University College Cork
- *Paul Koutstaal*, Deputy Department Head and Program Manager Energy Supply, PBL Netherlands Environmental Assessment Agency
- *Angelina LaRose*, Assistant Administrator for Energy Analysis, U.S. Energy Information Administration
- *Alessia De Vita*, Technical Advisor, GET.transform

Session Objective: This session was aimed at facilitating the dissemination of expert knowledge on scenario communication and methods to ensure effective policymaking. Participants discussed how scenarios' purposes and uses can necessitate a change in the communication strategy and identified tools to guide policy and investment decisions.

Key Takeaways:

- The discussion highlighted the necessity of involving stakeholders during the modelling process and sharing assumptions and limitations early on in the process, in to final results and reports generated. Sharing preliminary results and engaging stakeholders can help incorporate broader perspectives into models and can lead to greater buy in.
- It is vital to communicate the limitations in models, uncertainties and assumptions used when sharing modelling results and scenarios with stakeholders. This transparency can build trust and more effective engagement.
- To effectively communicate with policy makers, it is impactful to use clear and concise language and limit submissions to 1-2 pages to ensure maximum engagement.

Session Summary



Juan Jose Garcia (IRENA) – introduced the session and noted that the main theme of discussion was the effective communication of scenarios, The session would focus on how modelers can communicate to various stakeholders including investors, government ministers, policy makers and civil society.

Nadeem Goussous (IRENA)- presented on IRENA's work on effective communication. He noted that the Global Network on LTES shares surveys with members annually to gauge their interest in different topics. From the 2023/24 survey members noted that importance of work on participatory processes in LTES, consequently the LTES

secretariat is developing a toolbox on energy planning and participation. He noted that communication is important to ensure LTES are properly presented and used by recipients. Public participation processes can create feedback loops that help foster a good working relationship between modelers, policy makers and the citizenry.

The upcoming toolkit illustrates good practice across the globe and countries use a multitude of tools including workshops and visualization tools. Participatory processes help build confidence, identity risks and broaden perspectives during energy planning. A key recommendation in the toolkit is that countries should categorize stakeholders in different groups to enable context specific communication and effective engagement. During these processes it is important to clarify scenario limitations and work to navigate biases while addressing stakeholder concerns.

Session Summary

Angelina LaRose (U.S. Energy Information Administration)- noted that EIA is part of Department of Energy they work to collect and share information in a policy neutral manner. The EIA prepares long-term outlook and short term forecasts. The EIA publishes Annual Energy Outlooks that include at US domestic outlook and global outlook that forecasts the international energy market up to 2050. She noted that in 2024 the EIA didn't release outlooks as they were working to make improvements to their models and build in hydrogen and carbon capture use and sequestration technology (CCUS) into domestic models.

The EIA outlooks usually include technical and economic assumptions founded on current laws and regulations. The EIA does not define policy or backcast, instead the outlooks are geared towards providing insights based on current conditions. For instance, the 2023 Outlook analysed the impact of the Inflation Reduction Act specifically on the impact of tax on the domestic content in batteries. She noted that the EIA is asked by policymakers to run very specific cases that produced detailed policy based on their neutral framework

Paul Deane (University College Cork)- introduced the University College of Cork and noted that they provide technical assistance to the Irish government. The UCC is independent and unbiased and when communicating scenarios and modelling results to policy makers they have gathered a few lessons as follows. First, it is important to share short coherent bite sized pieces of information as long scientific papers are not useful for policy makers. Secondly, it is vital to go to the policy makers by attending events and other networking opportunities to inform them and remind them of the scientific research. Finally, he noted that to properly communicate with policy makers, the material presented should answer 3 questions: *What did you do? Why did you do it?* & *What did you find?*

Alessia De Vita (GET.transform)- introduced GET.transform and noted that they work to support national and regional partner institutions in Latin America and the Caribbean and in Sub-Saharan Africa to advance energy transition. GET.transform offers technical assistance and capacity building for the public sector to establish conducive policy and investment frameworks for the energy transition. She noted that GET.transform has 4 main workstreams: (i) long-term energy planning; (ii) renewable energy grid integration looking at technical needs; (iii) regulation and market development for on-grid and off grid projects. They provide assistance to partner countries through support building government capacity and establishing governance process; & (iv) developing models and scenarios for countries. From their work with governments, she noted that communication is necessary for effective capacity building and collaborating with policy makers.

Paul Koutstaal (PBL Netherlands Environmental Assessment Agency)- noted that PBL provides knowledge on planning and environmental issues to the government, parliament, civil society and the public. PBL is part of the government, but operates independently and publishes the annual Climate and Energy Outlook of the Netherlands. The outlook analyses the impact on the Netherlands' energy system on emissions. The outlook is used to measure the Netherlands progress on meeting policy targets including the European Union's target to reduce emissions by 55% in 2030 compared to 1990 levels.

The Outlook contain detailed modelling of the Dutch energy system and including analysis of over 300 policies and measures. The Outlooks contain the following policy scenarios: (i) actual policies in force; (ii) policies which are certain to be implemented; & (iii) policy plans not yet sufficiently elaborated for implementation. Additionally, one background scenario which includes extensive sensitivity analysis and results with uncertainty intervals.

Paul noted that there are a number of communication challenges faced by the PBL including conveying the uncertainties of the results in an understandable manner. The agency is working towards formulating main messages in a clear manner that does not allow for too broad of an interpretation. One strategy that the PBL uses is to include the nuances of the main report in the press release.

Plenary Discussion

Alessia De Vita (GET.transform)- to manage expectations in the different contexts that GET.transform works in it was noted that they engage stakeholder's ad enhance their capacity when they begin the long term energy planning process and manage expectations. GET.transform uses What If analysis to allow them to compare different aspects and come up with different scenarios- however it is important to communicate that forecasts are not predictions of the future.

Angelina LaRose (U.S. Energy Information Administration)- noted that messages should be tailored to the different stakeholder groups in a similar manner to what the EIA does. It is helpful to have different stakeholder group meetings to ensure effective engagement. Further, EIA explains the different aspects of their modelling based on the different questions raised. However, it is vital to explain uncertainties and

limitations to avoid misinterpretation. EIA engages groups in different manners including on social media for instance x (formerly known as twitter), in addition to workshops and webinars.

Paul Deane (University College Cork)- noted that in academic institutes the goal is usually for the research to sound intelligent, however when working with citizens and policy makers it is vital to communicate clearly based on the different contexts. . He gave an example of research by UCC on solar power in Ireland which was presented as a 5-page document highlighting how Ireland can produce more electricity from sunlight- this approach resulted in greater media traction, better engagment with policy makers and eventually resulting in lower taxation of solar photovoltaic panels in Ireland.

Paul Koutstaal (PBL Netherlands Environmental Assessment Agency)- noted that PBL works to ensure the credibility and engagement by the pubic with the Dutch Climate and Energy Outlooks. He noted the importance of engaging different stakeholders when developing their scenarios, this results in greater buy in by stokeholds. Regarding the incorporation of policy, PBL engages various departments when interpreting the impact of the polices; this approach helps achieve broader engagement and supports the development of more realistic scenarios.

Question and Answer Session

Ilija Batas Bjelic (Institute of Technical Sciences of SASA Serbia)- asked how the concept of soft linking electricity models is explained to decision makers based on research by Paul Dean.

Paul Deane (University College Cork)- noted that when talking about modelling it is important to clarify that optimization models show the world we wished we lived in as opposed to the world we live in. Soft linking methodology is used to address weaknesses in one framework by levering strengths of another. In the case referenced, it was around electricity models to explain why one cannot use large energy system models to understand small changes in the electricity models. He equated this to trying to catch mosquitos with fishing nets which is impossible as the temporal resolution is wrong- by soft linking one replaces the fishing net with a mosquito net. He reiterated that it is important to explain to policy makers the limitations of models and uncertainties.

Hans-Josef Fell (Energy Watch Group, Germany)- noted the importance of communicating in a manner that people understand. He noted that the fossil fuel and nuclear energy industries were able to communicate effectively with stakeholders and it is important to use lessons from their strategies in the renewable energy sector.

Malene Hovgaard Vested (Danish Energy Agency)- asked the panelists for their insights on how to practically engage with policy makers especially as modelers often have to balance publishing scientific papers with engaging with policy makers through networking events.

Paul Deane (University College Cork)- noted that most of his time is spent on communication and attending networking events as it is vital to engage directly with policy makers and present one's research.

He acknowledged that this approach is time consuming and takes time and requires support to ensure effective engagment with policy makers.

Hammad Ur Rahman (Ministry of Planning Development and Special Initiatives – Pakistan)- asked panelists for insights on how to highlight to policy makers and decision makers the limitations of the models to while building trust.

Kaare Sandholt (Energy Research Institute of National Development and Reform Commission – China)- asked about how to include nuances in press releases when presenting information in cases where both nuances and uncertainties ought to be communicated.

Paul Koutstaal (PBL Netherlands Environmental Assessment Agency)- noted that the Netherlands includes nuances based on grid capabilities when presenting aspects of energy generation expansion in scenarios. He highlighted the importance of comprehensive communication as it gives policy makers a better perspective of potential pathways.

Paul Deane (University College Cork)- Reiterated The importance of having clear and concise press releases to gain initial traction and allow for follow up engagment in other fora. He further noted the importance of stating the limitations of models to build and maintain trust.

Angelina LaRose (U.S. Energy Information Administration)- reiterated the importance of transparency in the modelling process and highlighted the limitation in the short and long term. She noted that when sharing the short-term EIA energy outlooks, it is clearly communicated that these are forecasts and long term outlooks are communicated as projections not predictions. She reiterated that the EIA communicates their policy neutral reference cases to stakeholders in order to minimize misinterpretation.

Dr. Alex TamunoMiegbam (online participant) - noted that there was a gap in obtaining the right data in renewable energy in Africa and asked panelists for insights on how researchers can fill the data gap.

Paul Deane (University College Cork)- noted that UCC and IRENA have good modelling tools, and it is useful to leverage on these resources when working on renewable energy in developing economies.

Alessia De Vita (GET.transform)- noted that modelers often need complete data sets while statisticians can work with some gaps in data. She reiterated the importance of communicating the data needs and working with stakeholders to fill the gaps using different techniques.

Jessica Arias Gaviria (National Mining and Energy Planning Unit - UPME – Colombia)- asked whether EIA as a non-political institution has to deal with stakeholders who reject results because they do not agree with the outcome.

Angelina LaRose (U.S. Energy Information Administration)- noted that the EIA ensures that people understand the purpose of the EIA Energy Outlook and the thought process behind the outlooks. She noted that EIA has been criticized for including electric vehicles in their Outlooks but this is based on current regulations. In response to these issues the EIA used their social media platforms to explain the thinking behind their results and directly addressing emerging issues.

Tiina Koljonen (VTT Technical Research Centre of Finland)- noted the importance of researchers being careful about the reports released as people can pick out minor aspects and highlight these in various fora. She noted that in Finland different committees in parliament hear results from researchers and give them about 5 minutes to ensure concise presentations. She noted that VTT Finland previously worked with artists through experimental workshops to ensure better communication of energy aspects, which was very enlightening for researchers.

Charlie Heaps (Stockholm Environment Institute)- noted that in the short term it is vital to be very concise when communicating while in the long term it is necessary to get more stakeholders involved. To engage more people in modelling capacity building is necessary to ensure a better understanding of modelling and the results keeping in mind the different nuances and uncertainties.

Closing Remarks

Paul Koutstaal (PBL Netherlands Environmental Assessment Agency)- highlighted the importance of modelers prioritizing communication to ensure greater impact.

Alessia De Vita (GET.transform)- noted that the long term has impacts on the short terms and politicians are not usually very interested in the long term, given their short terms in office. It is vital for modelers to keep this reality in mind as they engage with policy makers and present their results.

Angelina LaRose (U.S. Energy Information Administration)- highlighted the importance of adapting communication based on the different stakeholders. She highlighted they importance of engaging stakeholders throughout the study process and sharing results and assumptions as modelling is done as opposed to only sharing the final report.

Paul Deane (University College Cork)- noted that science must be robust and communication should support this. He encouraged participants to consider writing short newspaper articles about the energy transition to enhance the ongoing conversation in the different regions.

Session 3 (Co-hosted with UNFCCC): Aligning Energy and Climate Strategies: The Path to Consistent National Policy Frameworks

Moderator: *Romeo Bertolini*, Director of Operations and Head of Bonn Office, NDC Partnership

Opening remarks: *Gustavo de Naciff Andrade*, Deputy Head of Energy Economics, EPE, Brazil

Scene-setting presentations:

- *Kenichi Kitamura*, Programme Officer, UNFCCC
- *Iris van der Lugt*, Associate Professional, IRENA

Panelists:

- *Tiina Koljonen*, Research Team Leader, VTT Technical Research Centre of Finland
- *Francisco Domenech Guzmán*, Energy Foresight Analyst, Ministry of Energy, Chile
- *Glasha Obrekht*, Director, Environment and Climate Change Canada (ECCC)
- *Michelle Akute*, Manager – Energy Planning, Energy and Petroleum Regulatory Authority

Session Objective: This session provided a comprehensive overview of aligning Long-Term Energy Scenarios (LTES) with Long-Term Low Emission Development Strategies (LT-LEDS). The presentations and discussions shed light on the status of alignment between energy and climate planning, as well as national plans and the global 1.5C target.

Key Takeaways:

- Governments are encouraged to ensure alignment between global climate commitments and national energy planning while ensuring cohesion between short to medium term planning and long-term planning.
- Good communication and stakeholder engagement during planning contributes to proper alignment between energy and climate planning, as these practices build consensus.
- Inter-ministerial coordination is a critical factor for developing comprehensive modelling and achieving proper energy and climate planning alignment.

Session Summary

Romeo Bertolini (NDC Partnership Support Unit) introduced the session and highlighted the importance of alignment between national energy and climate planning. With the discussion moving from planning to implementation and the focus from global targets to national action, it is essential that global climate commitments like NDCs and LT-LEDS are harmonized with sectoral strategies including national energy plans.

Gustavo de Naciff Andrade (EPE, Brazil) shared the perspective of Brazil which is the 2024 G20 host country and in 2025 will host the UNFCCC COP30. It was noted that in August 2024, Brazil adopted the national energy transition policy, which will serve as a framework for the Brazilian energy transition which contains two key instruments in this framework are the national energy transition plan and the national energy transition forum. The framework is designed to support the alignment of the national energy policy with other policy frameworks and aims to attract investments to the planned projects whilst establishing

a platform for transparency and dialogue. Another key piece of the Brazilian national planning framework is the national climate change plan, which lays out the climate policy from 2024 to 2035. Integrating energy and climate policies is critical to the success of the energy transition.

Kenichi Kitamura (UNFCCC Secretariat) introduced the gap between Nationally Determined Contributions (NDCs) and the required pathway to limit the global temperature increase to well below 1.5°C. Global efforts to close this gap have focused on energy measures, like the global pledge to triple renewable energy capacity and double energy efficiency, as well as the phase-out of fossil fuel subsidies and phasing down unabated coal power plants. As countries need to submit enhanced NDCs by February 2025, governments are encouraged to align their new NDCs with Long-Term Low-Emission Development Strategies (LT-LEDS), to ensure cohesion between short- to medium-term and long-term planning. Of the 70 LT-LEDS that had been submitted so far, over half contained emissions projections per sector, including energy. Around 20% include detailed energy projection details, like electricity generation by source and primary and final energy consumption. It was noted that the alignment between energy and climate plans is one of the key outcomes of the first Global Stocktake.

Iris van der Lugt (International Renewable Energy Agency) introduced the preliminary findings from an upcoming IRENA report on the alignment between national long-term energy scenarios (LTES) and LT-LEDS. LTES and LT-LEDS tend to cover similar policy areas. It was further noted that innovation-related aspects and socio-economic elements tend to be underrepresented in national energy and climate plans. Most national energy and climate plans make reference to each other in their text, but there still remains a quarter of energy and climate plans that don't mention each other, which represents a clear room for improvement to avoid potential misalignment and policy incoherence. The IRENA analysis reviewed the presence of financial information in planning documents. While the vast majority of energy plans contain financial information and a dedicated section in finance in their text, important elements like the estimated amount of investment required as well as the time period in which the funding is required are often missed. Iincluding these elements is important to investors and promote the successful implementation of the plans.

Panel Discussion

Tiina Koljonen (VTT, Finland) shared Finland's experience with energy and climate planning, and noted that Finland's energy and climate planning has been integrated since the early 90s when the Ministry of Environment was established. In Finland, energy and climate strategies are made for the medium- and long-term, and research institutes are playing an increasingly large role in the development of these strategies. One of the success factors of the Finnish approach is the engagement of multiple stakeholders in the development process. The strategies aren't developed by just one ministry, but by a collaboration between multiple ministries (e.g. Ministry of Environment, Minister of Economic Employment, Ministry of Transport, Ministry of Finance, and the Prime Minister's office) and multiple research institutes, making it a whole-of-government approach. Finland currently faces some challenges

including the integration of socio-economic aspects and behavioural changes into the energy and climate modelling, dealing with uncertainties and keeping the costs of the implementation low.

Francisco Domenech Guzman (Ministry of Energy, Chile) shared the Chilean perspective on energy and climate planning integration. One of the success factors for alignment is good communication and stakeholder engagement, which helps to create consensus. It was noted that having stakeholders directly involved in the development of national plans is time-consuming but is necessary as it enhances the plans better and builds credibility. An inclusive approach ensures that the energy transition goals are common goals of the whole society. In Chile the climate change policy is formulated by a panel of multiple ministries. Broad political will for implementation is secured through the Climate Change Law, which creates sectoral obligations overseen by multiple ministries. It was noted that in addition to engaging the whole government, it's important to coordinate with the private sector. The Chilean electricity sector is privatized, therefore energy transition involve the private sector and incentivise the phase out of fossil fuels.

Glasha Obrekht (Environment and Climate Change Canada) shared Canada's work on aligning energy and climate plans, which is driven by legislative mandates, integrated policy frameworks, cross government collaboration and collaboration between key departments on modelling. Additionally, Canada ensures proper stakeholder engagement, incentivises investments in clean technologies and the use of energy models in planning. One of the key drivers of success is Canada's Net Zero Emissions Accountability Act, which provides a legal framework for the path towards net zero, and requires the setting of national emissions reduction targets in 5 year intervals to ensure progress. Additionally, there is a close collaboration between the agencies responsible for the Canadian energy modelling namely Environment and Climate Change Canada, Natural Resources Canada, and the Canada Energy Regulator. There is a trilateral memorandum of understanding in place which ensures the coordination on energy modelling approaches and improves the comprehensiveness of the modelling. Finally, Canada's advanced capacity for energy modelling is a key success factor in understanding the potential impacts of policy options on energy transition and emission goals. Canada is facing a challenge related to the jurisdictional complexity of the Canadian federal system: both the federal and provincial levels of government have jurisdiction over energy matters. This can pose a challenge as there are multiple priorities, resources, and capacities which ought to be reconciled. Additionally, there is a high level of regional diversity and differences in public support. Given this backdrop broad public support is needed to successfully implement energy and climate strategies, as such flexibility and adaptability are necessary to promote national coherence.

Michelle Akute (Energy and Petroleum Regulatory Authority, Kenya) shared Kenya's experiences with aligning energy and climate planning, which is a new approach in Kenya. Historically, Kenya's planning focus was to match energy demand with supply. Kenya has major hydropower resources, and excess demand is supplemented by fossil resources. Kenya is ramping up the generation capacity of it's geothermal resources in a bid

to diversify the national energy mix. To align climate and energy goals, Kenya's Ministry of Environment holds stakeholder engagement meetings where realistic targets for each sector are discussed. It was noted that the participatory processes are still being developed and currently there is no guarantee that the bottom-up sectoral targets are fully harmonized, but the speaker described the country's approach as a *work in progress* toward a more cohesive national strategy.

Panel Discussion

How are countries aligning LTES and LT-LEDS and what are the major challenges

Tiina Koljonen (VTT, Finland) noted that in Finland a positive aspect is that there are many investment plans which are awaiting financing. However, it is challenging for Finland when assessing plans under their With Existing Measures (WEM) scenarios in the National Energy and Climate Plan (NECP), it is evident that they need to change national policies in order to achieve the pathways envisioned in the scenarios. Finland has recently experienced major issues relating to end use sectors and energy supply given the sanctions on Russia. To tackle these challenges Finland's previous last NECP heavily focuses on land-use, land use change and forestry (LLUCF) and Green House Gas mitigation. However, Finland is not able to conduct impact assessment of the indirect impact of current policy measures and their impact in achieving their NECP targets.

Francisco Domenech Guzman (Ministry of Energy, Chile) noted that in Chile the main issues that modellers face is uncertainty and unforeseen issues. During the pandemic Chile had projections for every sector and the impact of the pandemic. However, some sectors completely changed for instance when it comes to the transport sector, during the pandemic there was an increase in private cars which resulted in higher fuel consumption. This changed the landscape of the transport sector and now Chile has a large private transportation sector as compared to the public sector- which was not the case before the pandemic. A second challenge faced by Chile is the coordination between public and private sectors and also coordination amongst government ministries. In Chile, each ministry tends to have individual goals but these are not always coordinated. A third challenge is that polices need to be backed by stakeholders, and there is need for better engagement during scenario and policy development to ensure proper implementation. A final challenge is that there are private and public sector agreements that require better coordination for Chile to achieve its decarbonisation plans in the coal sector. As Chile works towards a just transition, the government aims to ensure that everyone benefits especially those economically disadvantaged.

Glasha Obrekht (Environment and Climate Change Canada) noted that the main challenge for Canada is jurisdictional coordination as energy sector governance is shared between the federal and provincial governments. Provinces have oversight over resources and electricity generation while the federal government oversees transmission and energy trade. In some cases, the federal and provincial authorities have differing goals which need proper coordinated. It was noted that provinces reliant on fossil fuels are not as willing to transition from fossil fuels and this causes issues when planning for the transition at the national level. Canada has a diverse energy landscape some provinces rely on different resources including oil and gas, hydropower and nuclear therefore it is necessary to be flexible and adaptive when dealing with different regional priorities and ensuring national coherence.

Michelle Akute (Energy and Petroleum Regulatory Authority, Kenya) noted that in Kenya the is a feed in tariff policy in place which encouraged uptake of renewable energy. However, when there is a lot of

variable renewable energy (VRE) uptake in the system which has resulted in the vulnerability of geothermal generation. There is need for demand side management initiatives to ensure that geothermal energy resources which are not flexible, can be included in the national energy mix. To this end Kenya is considering generation of green hydrogen using geothermal and other longer-term solutions.

Additionally, Kenya plans to electrify the transport and cooking sectors, and this will increase peak demand. The government is considering introducing incentives to reduce peak demand for instance incentivise people to charge vehicles overnight or at other times.

It was noted that transmission planning in Kenya is not done in tandem with capacity planning as there are often delays associated with land acquisition for power line way leaves. The government is working to streamline the process to ensure faster delivery of transmission projects.

How are you involved in the update of NDC 3.0?

Tiina Koljonen (VTT, Finland) noted that Finland is developing an energy planning strategy and working on a long-term strategy based on their national climate law. Finland has a framework for reporting to their climate commission and based on this framework and institutional structure they are creating the next NDC and aiming for climate neutrality in 2035. She noted that researchers in Finland have the freedom to create alternative futures in their LTES and these are used by policy makes.

Francisco Domenech Guzman (Ministry of Energy, Chile) stated that Chile is working on NDC 3.0 and the Ministries of energy and environment are leading the process. Additionally, Chile engages stakeholders in creating their NDC 3.0.

Glasha Obrekht (Environment and Climate Change Canada) noted that Canada has a Net Zero Accountability Act which requires the government to set targets every 5 years with inputs for an expert advisory board. It was noted that Canada was working on their 2035 climate targets and engaging stakeholders and conducting collaborative modelling exercise. Once this process was over Canada would include the new targets in their NDC 3.0 and submit these to the UNFCCC in February 2025.

Michelle Akute (Energy and Petroleum Regulatory Authority, Kenya) noted that Kenya was testing various goals for instance the e-cooking target was going through a pilot phase assess its feasibility. It was noted that Kenya was analysing the sectoral plans in a bid to understand how they interact with other plans as the country works towards an Integrated Energy Plan. This will ensure that all sectoral, national and county plans are coherent.

Question and Answer Session

Hans-Josef Fell (Energy Watch Group, Germany) noted the importance of more stringent climate targets at the national and global level given the climate emergency. He noted that it is vital for countries to work together to reduce emission and meet the climate targets set in the 2015 Paris Agreement.

Tiina Koljonen (VTT, Finland) noted that in recent year it was evident that governments should assess the entire value chain including those related to metals and minerals imported from developing countries. It was noted that under the REPower European Union plan, Finland was looking to reinvest in their economy while working to decrease emissions and other types of consumption. It was noted that when economic welfare is calculated it should not only be based on production but also on additional indicators.

Jessica Arias Gaviria (National Mining and Energy Planning Unit - UPME – Colombia) noted that in Colombia the setting of realistic climate goals is typically used by industries as an excuse for inaction and less reduction of emissions. She asked whether this has been the case in Kenya.

Michelle Akute (Energy and Petroleum Regulatory Authority, Kenya) noted that in part some goals are not applicable across all industries- or when they try to apply standard goals new challenges emerge. She highlighted the importance of an integrated energy plan that includes all sectors including transport, cooking and residential sectors to ensure they work together to achieve national climate goals. It was noted that to deal with supply and demand issues related to geothermal electricity production, the Ministry of Energy has proposed that new solar PV projects to include battery storge systems.

Ilija Batas Bjelic (Institute of Technical Sciences of SASA, Serbia) noted that national energy planning is no longer about meeting demand but to meet climate goals. He noted that in the energy transition energy demand is less important than ensuring an inhabitable common planet and energy planners should keep this in mind. Regarding coordination amongst different ministries he proposed that ministries should work together to create a single energy plan using a sector coupling approach.

Michelle Akute (Energy and Petroleum Regulatory Authority, Kenya) asked whether in the different provinces in Canda develop their own energy plans and how this is harmonised at the federal level.

Glasha Obrekht (Environment and Climate Change Canada) noted the importance of communication and engagement with the different provinces and regions in energy planning. She noted the importance of having a flexible approach to ensure that provincial and national plans are coherent. Canada uses Equivalency Agreements where when there is a federal regulation in place, provinces can apply for the equivalency agreement which allows them to develop their contextually compatible provincial law which is applicable in place of the national regulation so long as it is as stringent as the national version. Additionally, the federal government takes into account results from modelling at the provincial level when developing national regulations to ensure they are appropriate for the different regions.

She asked about the uncertainty analysis that Finland conducted and asked which parameters and sensitivities were used.

Tiina Koljonen (VTT, Finland) responded that Finland looked at the different operation environments assuming that there are different levels of economic growth It was highlighted that Finland looks at global trade, new technology and investments patters. The assumptions used are related to population. Emissions trading and the price of fuel which remained the same across all 3 models. Additionally, they considered the timing of investments in different industries as they move away from fossil fuels for instance the decarbonisation of the steel sector. For the agricultural and transport sectors, they consider the changes in peoples' preferences.

Romeo Bertolini (NDC Partnership Support Unit) closed the session by noting that there is a lot of alignment between LTES and LT-LEDS. He noted in his closing remarks that information quality is a key

consideration when modelling and accounting for risks and unforeseen events. It was highlighted that Finland is a good practice case given that they score highly on the world happiness index and had managed to navigate the European energy crisis. It was noted that there ought to be clear communication on how countries develop their NDCs to foster proper cross ministerial and cross sectoral coordination. Thirdly, it was noted that finance is crucial and countries should assess the costs of mitigation, adaptation and resilience in both climate and energy planning. Finally, the importance of engaging all stakeholders including the civil society was highlighted when planning for low emission infrastructure and the energy transition.