Transitioning to a Sustainable Energy Future in Australia

Initiatives from Overseas

Several international initiatives are driving the transition to a sustainable energy future, showcasing a global commitment to clean energy and climate action.

1. **International Renewable Energy Agency (IRENA)**
   IRENA is a key global player promoting renewable energy adoption, estimating that 90% of the world's electricity could and should come from renewable sources by 2050. Their work includes policy advice, capacity building, and technology support to accelerate renewable energy deployment worldwide.

2. **Leading Countries in Renewable Energy**
   Countries like Denmark, Iceland, Uruguay, and Costa Rica are leading by example, heavily investing in wind, geothermal, and hydroelectric power to achieve nearly 100% renewable electricity generation. These nations demonstrate how a transition to low-carbon, zero-emissions energy systems is feasible and beneficial.

3. **Clean Energy Transitions Programme (CETP)**
   The International Energy Agency's CETP supports countries in creating enabling environments for energy transitions. It focuses on capacity building, policy frameworks, and practical measures to help nations shift from fossil fuels to clean energy sources efficiently and equitably.

4. **European Union's Global Strategy**
   The EU has launched a new strategy focusing on decarbonizing energy-intensive industries and supporting a global clean and resilient energy transition. This includes financial and policy support to help industries switch to renewable energy and manage energy costs sustainably.

5. **United Nations Initiatives**
   The UN promotes renewable energy technology as a global public good, advocating for improved access to raw materials and components essential for renewable energy infrastructure. It also emphasizes leveling the playing field for renewables against fossil fuels and accelerating the global energy transition to meet climate goals.

6. **Global Public Support and Economic Sense**
   According to the latest UN Peoples' Climate Vote, 85% of countries support a swift transition away from fossil fuels. The UN also highlights that renewable energy not only addresses climate change but increasingly makes economic sense due to falling costs and job creation potential.

These initiatives collectively reflect a growing global momentum toward sustainable energy, combining policy innovation, international cooperation, and practical implementation to create a cleaner, safer energy future for all.

Domestic and Commercial Initiatives

Australia is actively advancing its sustainable energy future through a mix of domestic and commercial initiatives that highlight strong growth in renewable energy and energy efficiency.

Domestic

- **Rooftop Solar and Battery Expansion**
  Australia has seen significant growth in distributed energy resources (DER), especially

rooftop solar PV and home battery systems. This expansion has helped renewables supply a record 43% of electricity in 2025, with households saving around $1,500 annually on energy bills by installing rooftop solar, a figure that can almost double with battery use.

- **Trajectory for Low Energy Buildings**
  The government has implemented the Trajectory for Low Energy Buildings plan, aiming to improve energy efficiency in residential and commercial buildings. This coordinated effort focuses on reducing energy consumption and emissions from the built environment through updated standards and incentives for low-energy construction and retrofitting.

Commercial and Industrial Context

- **Renewable Energy Zones (REZs) and Grid-Scale Projects**
  Large-scale renewable energy projects are booming, particularly in New South Wales and Victoria, where Renewable Energy Zones are being developed to supply clean power to the grid. However, some critical infrastructure like transmission lines to carry this energy is delayed, with key projects now expected online around 2030 instead of earlier projections.
- **Clean-Tech Manufacturing Growth**
  Australia is bolstering domestic clean-tech manufacturing, including solar module assembly and grid-scale battery component production. This strengthens supply chains and supports local jobs while reducing reliance on imports for renewable energy technologies.
- **Regulatory Reforms in the National Electricity Market (NEM)**
  Recent regulatory reforms in the NEM aim to improve market efficiency, support renewable integration, and provide clearer frameworks for energy storage, demand response, and grid stability. These reforms are designed to facilitate the transition to a more decentralized and renewable-heavy energy system.
- **Renewable Energy Target (RET)**
  The Australian Government's Renewable Energy Target continues to drive investment in renewable electricity generation, aiming to reduce greenhouse gas emissions in the electricity sector and increase the share of renewables in the energy mix.

Summary

Australia's energy transition is marked by rapid domestic uptake of rooftop solar and batteries, strategic government plans to improve building energy efficiency, expanding commercial renewable projects, and reforms to support a cleaner, more resilient grid. Challenges remain in infrastructure development timelines, but the overall trajectory points toward a sustainable energy future with growing local industry and consumer benefits.

Natural Gas to Electrification

Australia is actively planning a transition away from natural gas toward electrification, especially powered by renewable energy, to decarbonize its economy and meet climate goals. A prominent voice in this conversation is Saul Griffith, whose proposal "Electrify Australia" outlines a comprehensive roadmap for this shift.

Australia's Shift from Natural Gas to Electricity

- **Policy and Market Trends**
  Australia is increasingly recognizing the need to reduce reliance on natural gas, which currently fuels electricity generation, heating, and industrial processes but contributes substantially to greenhouse gas emissions. The government and industry are promoting electrification of buildings, transport, and industry sectors, powered by the rapidly growing renewable electricity supply.

- **Electrification of Heating and Industry**
  Efforts focus on replacing gas heating and industrial processes with electric alternatives such as heat pumps and electric boilers. This is supported by improving the electricity grid and expanding renewable energy capacity to meet increased demand sustainably.
- **Infrastructure and Regulatory Support**
  Investment in grid upgrades and smart technologies is underway to handle the increased load from electrification. Regulatory reforms in the National Electricity Market (NEM) aim to better integrate renewables and enable demand-side participation, critical for managing the transition away from gas.

Saul Griffith's "Electrify Australia" Proposal

- **Core Idea**
  Saul Griffith, an engineer and climate advocate, proposes a bold plan to rapidly electrify all energy uses in Australia, including transport, heating, and industry, powered by renewable electricity. His vision emphasizes that electrification is the most efficient and scalable pathway to decarbonization.
- **Key Components**
  - Replace gas appliances in homes and businesses with electric heat pumps and induction cooktops.
  - Electrify transport through electric vehicles (EVs) and public transport.
  - Expand renewable energy generation massively, including solar, wind, and energy storage solutions.
  - Upgrade the electricity grid to handle higher loads and enable smart energy management.
  - Implement policies and incentives to accelerate adoption, including subsidies and regulations to phase out gas infrastructure.
- **Benefits Highlighted**
  Griffith argues that electrification will reduce emissions dramatically, lower energy costs over time, improve air quality, and create jobs in clean energy sectors. His proposal also stresses equity, ensuring vulnerable populations benefit from clean energy access.

Summary

Australia's move away from natural gas toward electrification aligns with global decarbonization trends, supported by government policies, market reforms, and infrastructure upgrades. Saul Griffith's "Electrify Australia" proposal offers a clear, actionable blueprint emphasizing rapid electrification powered by renewable energy as the fastest and most effective path to a sustainable energy future.

What Still Needs to Be Done to Phase Out Coal in Australia

1. Accelerate Coal Plant Closures with Clear Timelines

- Many existing coal plants have announced closure dates, but some remain operational beyond 2030. Accelerating these timelines with firm government policies and clear phase-out schedules is essential to avoid lock-in of emissions.
- Establishing a national coal exit strategy with legally binding targets would provide certainty for investors, workers, and communities.

2. Scale Up Renewable Energy and Storage Capacity

- To replace coal's large baseload supply, Australia must rapidly expand renewable generation (solar, wind, hydro) and invest heavily in energy storage technologies like batteries and pumped hydro to ensure grid reliability.
- Development of Renewable Energy Zones (REZs) must be expedited, including timely construction of transmission infrastructure to connect new renewable projects to demand centres.

3. Upgrade and Modernize the Electricity Grid

- The grid requires substantial upgrades to handle intermittent renewable energy, distributed energy resources, and increased electrification demand.
- Smart grid technologies, demand response, and grid-scale storage solutions are critical to maintaining stability as coal plants retire.

4. Support Workers and Communities in Transition

- Coal-dependent regions need comprehensive just transition programs, including retraining, economic diversification, and social support to manage job losses and community impacts.
- Collaboration between governments, industry, and unions is vital to ensure fair outcomes and maintain social cohesion.

5. Enhance Policy and Regulatory Frameworks

- Strengthening carbon pricing, renewable energy incentives, and emissions reduction targets will drive investment away from coal.
- Streamlining approval processes for renewable projects and storage can reduce delays and lower costs.

6. Address Energy Affordability and Security

- Ensuring a reliable and affordable electricity supply during the transition is paramount to maintain public support and economic stability.
- Investments in flexible generation, demand management, and interconnections with neighbouring markets can mitigate risks associated with coal exit.

Summary

Phasing out coal-fired power in Australia requires a coordinated approach combining accelerated plant closures, massive renewable and storage buildout, grid modernization, just transition support, and strong policy frameworks. While progress is underway, closing the gap between ambition and implementation is crucial to meet climate targets and secure a sustainable energy future.

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