

# Geared up for change

Asia Pacific region has strong foundations for achieving an energy transition – but much remains to be done

# Energy transition: Much work still to do

The second annual Asia Pacific Energy Week revealed a major gap between perception and reality when it comes to carbon emissions. Systemic changes are urgently required to speed up the region's energy transition.

**A seismic shift** is transforming traditional energy structures across the globe, redefining what it means to create a sustainable world. Developing and implementing solutions requires collaboration. Energy Week conferences, a series of events each focusing on a different geographical region hosted by Siemens Energy and partners, bring together industry, political and society leaders from around the world to tackle the increasingly serious challenges that face not only the energy industry but society at large.

Few areas are as exposed to the effects of climate change as much as the Asia Pacific region. Home to some of the world's fastest-growing economies, maintaining prosperity in the region while accelerating the energy transition will not be easy. On March 28-29, 2022, the Asia Pacific Energy Week brought together key leaders from the fields of energy, technology, finance, business, and government to discuss the many challenges – and some potential solutions. Participants were also asked about the importance of a set of key energy priorities and what progress they have achieved towards the energy transition.

“To meet carbon reduction targets, businesses in the Asia Pacific region will need to reduce their reliance on coal as an energy source and increasingly turn to renewables.

Denis Depoux, Global Managing Director, Roland Berger

“As one of the fastest growing regions in the world, energy demand in the Asia Pacific region is rising massively. Properly addressed, the energy transition can serve as **THE growth accelerator par excellence.**

Christian Bruch, President and CEO, Siemens Energy

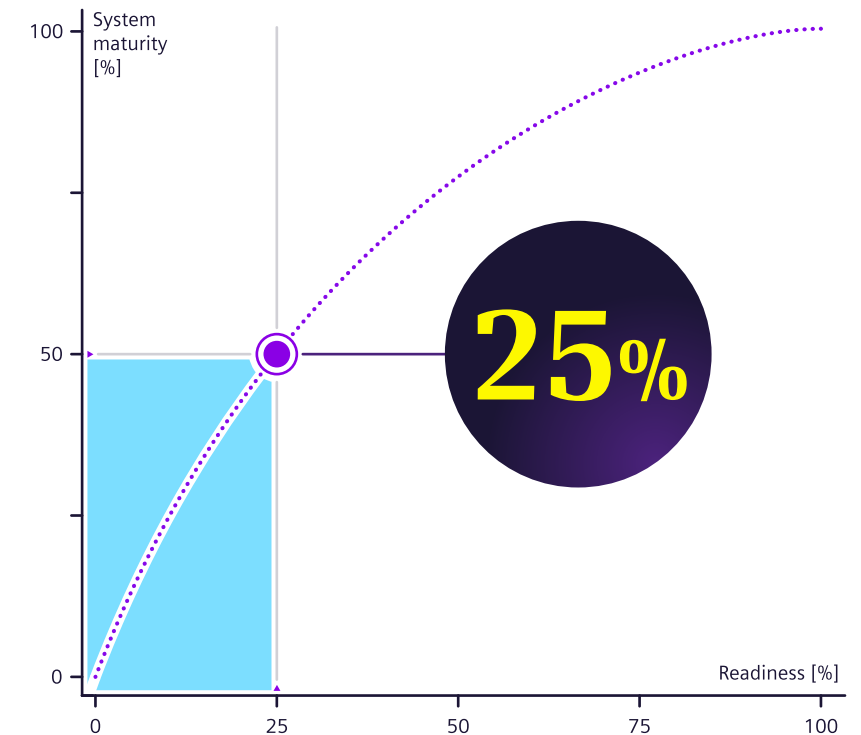
## Methodology

During the conference participants (expert and decision-makers across the energy sector in Asia Pacific) in each session completed a short survey on the session's topic. Up to 470 session participants answered the survey. The Energy Transition Readiness Index is calculated based on these survey results. Participants were asked to give their expert opinion on the progress of each of 11 energy priorities (see page 8). The index aggregates the answers of the experts by combining the progress of each priority ("readiness") with the assessment of its respective importance ("system maturity" as measured by the average importance of all priorities, with higher average pointing to a more systemic approach toward energy transition). The index describes the perceived readiness, on a scale of 0% to 100%, of the energy transition towards net zero in the Asia Pacific region.

## Key insights: Just getting started

**The Asia Pacific Energy Week** yielded many valuable insights. Worryingly, perception and reality regarding the climate situation in Asia Pacific differ widely. Between 2005 and 2020, for example, regional carbon emissions grew by around 50%, yet participants believed that they fell by almost one-third. Participants' visions of the future are also extremely optimistic: They anticipate that emission levels in 2030 will be 40% lower than in 2005. Even though over 40% of global investments in the energy transition are made in the region, this does not sufficiently impact emission reduction (Source: BloombergNEF). Still, many of the developments required for the energy transition in Asia Pacific can be considered as in their infancy.

To speed up the process, systemic changes are urgently required, particularly adjustments to government policies and the sourcing of new funding. Economic changes, such as commercialization and cross-industry collaboration, will also be of help. International partnerships can ensure that the region benefits from experience gained elsewhere. By leveraging on a fair energy transition that addresses the necessary redistribution, Asia Pacific can position itself in a balanced way in the triangle of security of supply, sustainability, and affordability.



Overall, Asia Pacific sits at just 25% readiness for the energy transition. This is a solid foundation, but there is still a very long way to go – especially as the region is the biggest contributor to carbon emissions in the world. Asia Pacific thus needs to take all its energy priorities more urgently, while global climate efforts must involve the region more in the future. This includes, for example, the recent hydrogen ambition by Australia to reach for USD 2/kg production costs for green hydrogen, which according to the IEA are between USD 3/kg and USD 8/kg today.

# CO<sub>2</sub> emissions: Perception vs. reality

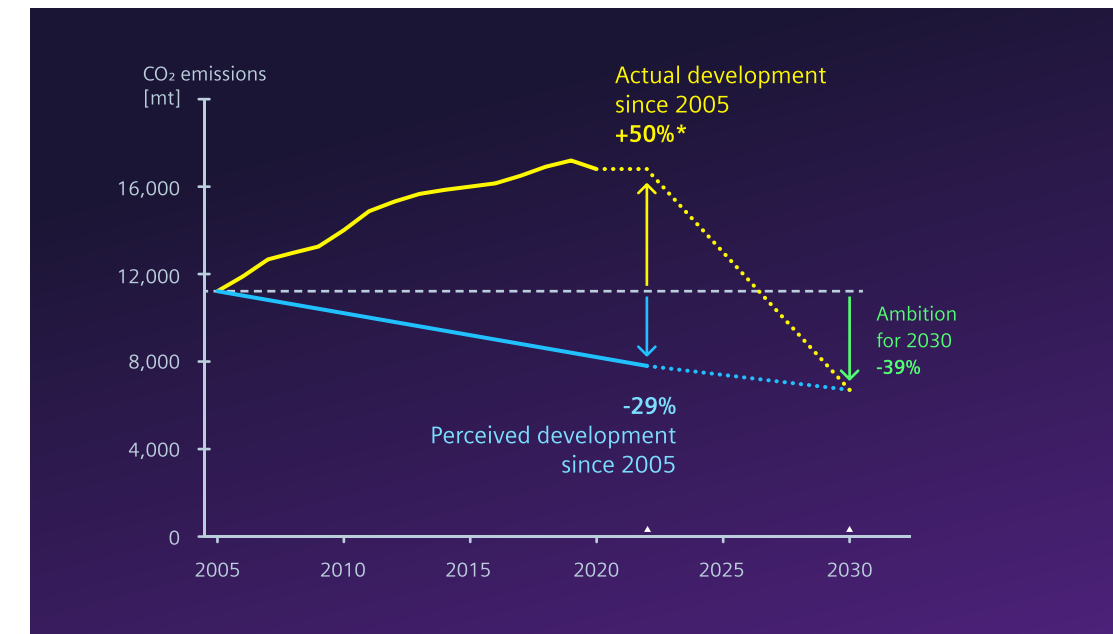
## Identifying energy priorities

Global management consultancy and Energy Week partner Roland Berger identifies in close collaboration with Siemens Energy 11 priorities for tackling the energy transition. Successfully addressing these priorities on a global level will result in significant decarbonization and is likely to lead to net zero emissions.

**CO<sub>2</sub> emissions** are a major problem in Asia Pacific: In 2020 the region was responsible for around half of the world's CO<sub>2</sub> emissions. And total emissions are on the rise, with strong economic growth in some parts of the area pushing up carbon emissions by around 50% between 2005 and 2020. Yet, most conference participants believe that emissions actually fell rather than rose during this decade and a half – by an estimated 29%. Where does this mistaken perception come from? The fact is decarbonization is successfully underway in several areas. However, increasing demand for energy due to strong economic growth has been counteracting this progress, leading to a net increase in emissions overall.

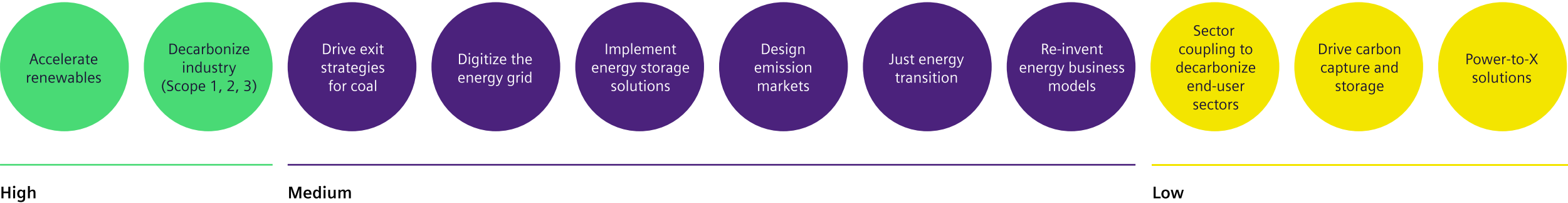
## High ambitions for 2030

Participants expect carbon emissions to fall by 39% by 2030 compared to their 2005 level. This is highly optimistic and unlikely, given the growth in emissions seen between 2005 and 2020. Yet, the target is important in terms of restricting climate change to 1.5°C and achieving climate neutrality by 2050. Ultimately, maintaining economic growth and prosperity while simultaneously reducing emissions in the medium and long term will be extremely challenging.



What is the level of CO<sub>2</sub> reduction in your country today and what will it be in 2030 compared to 2005?

# Ranking the energy priorities



In the period to 2030, how strongly will each of the 11 energy priorities impact your achievement of climate targets? (low impact = 1; medium impact = 2; high impact = 3)

**Participants agreed** unanimously that each of the 11 energy priorities had an important role to play in Asia Pacific. At the top of the list were the accelerated expansion of renewables and the decarbonization of industry. While renewable technology is maturing quickly, implementation and integration still have a long way to go in the region.

Respondents considered a number of priorities to be of roughly equal importance, including exit strategies for coal and a just energy transition. Less important in their view were Power-to-X solutions, such as hydrogen and carbon capture and storage (CCS). This is surprising, as Power-to-X could offer effective long-term energy storage solutions, while CCS would allow longer use of coal for power generation.

“Our belief is that you're going to have to tackle both sides of the supply and demand spectrum in order to execute and implement the energy transition.”

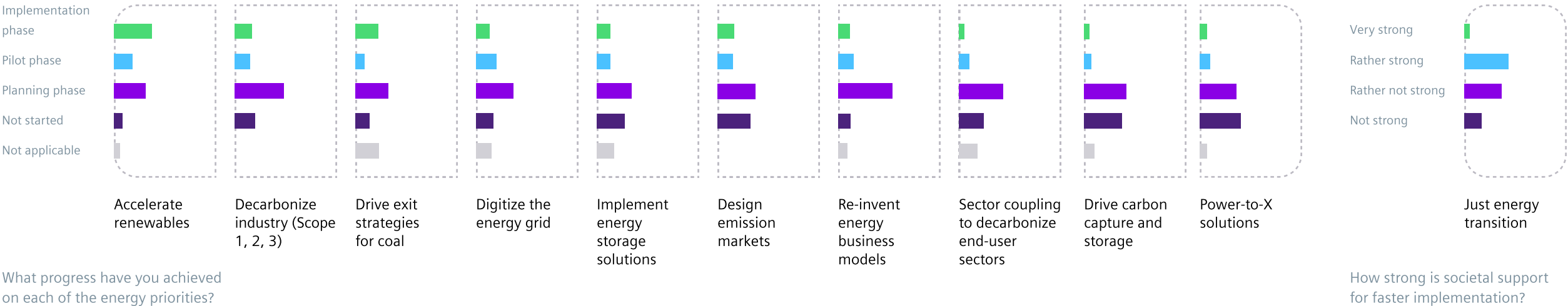
Daniel Icasiano,  
General Manager Heavy Manufacturing Decarbonisation, Shell

# Work to do: Current progress on energy priorities

**Progress on the 11 energy priorities** is slow in Asia Pacific overall, with many participants still in the planning phase for specific priorities. There is a long way to go before reaching the 2030 targets. Broadly speaking, progress on each priority matches its perceived level of importance. Thus, power generation shows the most progress, with more than 80% of participants saying that the acceleration of renewables is at least in the planning phase, and around one-third saying it is already at implementation stage. Almost two-thirds of respondents report a similar level of progress for coal exit strategies. By contrast, little headway has been made on technological abatement, such as Power-to-X solutions and CCS, with very few participants having moved beyond the planning stage.

“The real impact of the energy transition is really allowing communities to contribute positively. This allows them to have access to energy, the possibility of increasing green jobs and improved livelihoods, and local well-being.”

Angela Consuelo "Gia" Ibay,  
Climate Change and Energy Programme  
of WWF Philippines



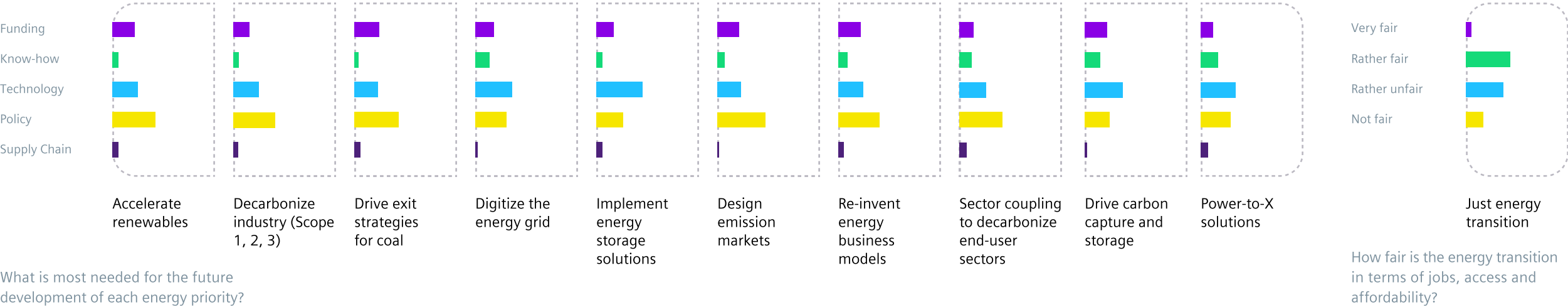
# What needs to be done?

**Further development** across different areas is needed in order to drive progress in the energy priorities. Participants in the conference see policy as the most important factor overall for almost every priority. This gives cause for hope, as many participants believe that political willingness to act is high. In addition, the war in Ukraine has further increased the desire to speed up the adoption of renewable energy. Participants also see funding as a major requirement for most priorities. Government subsidies will be required to make business models profitable, at least in the short term. The need for additional know-how varies but is highest in new technologies such as CCS and Power-to-X solutions. Assuming technology can be widely supplied once available, supply chain development is not seen as a priority for future development.

Additionally, when asked about the technologies that will be most significant in the future, the participants gave a wide range of opinions. In line with the statements on the energy priorities, about one-third of the participants stated that renewables will be the most important. This is followed by emerging technologies such as Power-to-X, CCS, as well as energy storage. However, the range also shows that a small group considers nuclear power as a significant part of their decarbonization strategy.

“Each country will develop its own technological roadmap to reach net zero in accordance with its respective geographical constraints. We have to create a bridge between three factors – sustainability, affordability and reliability.”

Vinod Philip, CTO, Siemens Energy





# Energy priorities in detail

## Drive exit strategies for coal

Decarbonization requires a step-by-step phase out of power and heat generation from coal. Strategies must manage this while simultaneously ensuring a secure supply of power and heat. Coal's role in the transition to carbon neutrality must be clearly defined within these strategies.

## Accelerate renewables

The speed of the expansion of renewable energy is strongly linked to the speed of decarbonization. However, technological, societal, and bureaucratic barriers partly impede progress. Lifting these barriers is key to speeding up the roll-out of renewable energy solutions.

## Drive carbon capture and storage

Carbon capture and storage (CCS) is a technological solution for capturing emissions and storing carbon in a way that lessens its climate impact. Decarbonization strategies must define the role of CCS technologies in the transition towards climate neutrality.

## Digitize the energy grid

A greater share of intermittent renewable energies makes it more challenging for power grids to maintain a secure power supply. The safe and reliable set up, maintenance and operation of the future energy grid requires new digital solutions.

## Implement energy storage solutions

The intermittency of renewables necessitates both short-term and long-term energy storage solutions. Technological and economic solutions must be devised to ensure that 100% renewable energy generation delivers a highly secure supply.

## Power-to-X solutions

The transformation of power to hydrogen and other Power-to-X fuels enables the storage of otherwise curtailed renewable energy. Additionally, Power-to-X fuels can be used in hard-to-abate sectors such as aviation and shipping or high-temperature industrial processes.

## Decarbonize industry (Scope 1, 2, 3)

Industrial production can generate significant carbon emissions. These must be reduced across Scopes 1, 2 and 3 in order to move towards a carbon-neutral industry and society. The roll-out of new production processes and energy-efficiency measures must define a pathway to carbon neutrality.

## Sector coupling to decarbonize end-user sectors

All energy end-user sectors must be decarbonized to create a truly climate-neutral society. With an increased share of renewable power generation, the heating and mobility sectors can be decarbonized via the electrification of end-user appliances.

## Re-invent energy business models

Energy business models are a key enabler for fostering investment in decarbonization technology, for example, via contracting solutions. Solutions such as PPAs (power purchase agreements) and long-term trading can secure payment streams over the investment period, which makes investments bankable and suitable for low-interest financing.

## Design emission markets

An overarching regulatory framework must ensure the cost-efficient reduction of carbon emissions wherever possible. Implementation of emission markets and/or carbon pricing mechanisms is crucial in order to align incentives across continents, countries, and sectors.

## Just energy transition

Social acceptance is an essential component of the energy transition. A fair energy transition further includes affordable energy supply, decent working conditions, as well as diversity and inclusion. Social distortions must be avoided, as well as energy poverty and resistance to renewable energy.





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