

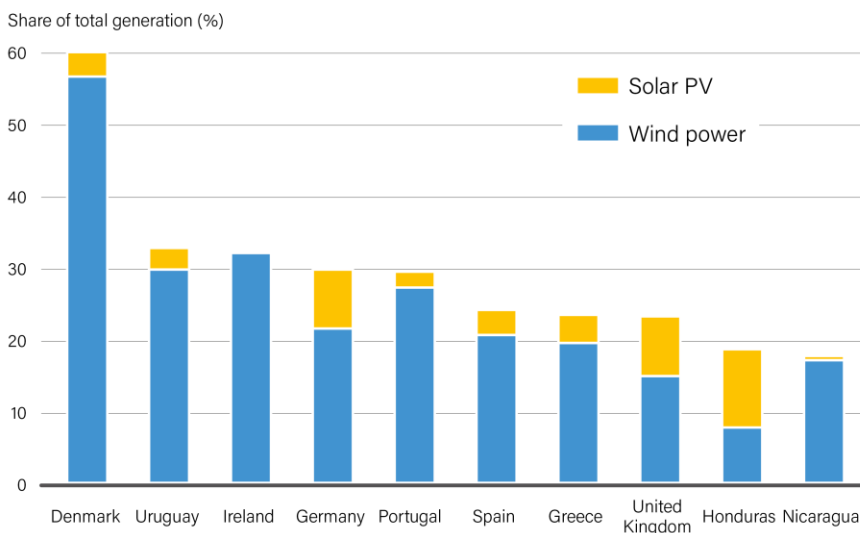
THE ROAD TO RENEWABLES NEEDS POWER GRIDS

Decarbonising the energy system means using more renewable electricity to meet our energy needs – including for transportation and the heating and cooling of buildings. Fortunately, over the past decade, it has become more economical to invest in new wind and solar photovoltaic (PV) power sources than building new, or operating existing, fossil fuel power plants. From Denmark to Honduras, more and more countries are expanding the amount of their energy generation coming from wind and solar. This boom in renewable power is a step in the right direction to reduce air pollution and greenhouse gas emissions. Yet, one major stumbling block in making a complete transition to renewables is the delivery system for electricity: the grid.



A greater demand for electricity requires both renewable sources and a stronger power delivery system.

Share of Electricity Generation from Variable Renewable Energy, Top Countries, 2019



Note: Figure shows countries among the top 10 according to the best available data at the time of publication. However, several small-island countries with low total generation may be excluded from this list.



What do power grids have to do with renewable energy?

Networks of millions of small and large power stations already provide electricity to our homes, workplaces, public transport systems, private vehicles and industries. However, electrifying building heating systems, the transport sector and industrial processes to a greater extent **will require a considerable expansion of existing grids**. For example, electrifying the transport sector alone – which now mostly relies on oil – could double global electricity demand. Similar projections hold for electrifying heat in our buildings. Overall, electrification of buildings, transport and industrial processes will require expansion of grids.

Strong connections between renewable power supply stations and areas of high energy demand are necessary to account for weather-related variations in energy supply. By integrating different energy sources and diverse geographical/weather zones, the grid can smooth out variable electricity generation. In this way, a well-designed power grid network is a cost-effective way to harness energy surpluses (in very sunny and windy locations) and fill in gaps (in cloudy areas or those without wind). The **power grid of the future** must be able to deliver energy where it is needed, and when.

It is challenging to generate electricity for an entire urban area within a city's limits, so power grids will also need to be able to transport electricity from areas with good solar and wind resources to those with high demand for energy, like cities and industrial areas. As renewable energy is cheaper to produce far from residential and urban spaces, a strong grid that can transport electricity long distances is essential.

Grids also have the potential to transform socioeconomic environments – for example, a well-designed network can create jobs and income in rural communities. Communities that generate their own renewable energy may want to sell surplus power to areas where there is a high energy demand.

How does grid expansion happen?

Predicting and planning how and where electricity will be generated is fundamental in the grid development process. If the planners do not account for the use of renewable energy in their predictions or fail to account for a significant increase in demand for electricity, the grid may not be able to support a clean energy transition.

One pathway for determining future energy supply and demand is through the development of **energy scenarios**. A scenario is an energy vision that describes a future derived from agreed policy objectives. It can then help identify what actions must be taken now **to achieve the desired outcome**. Australia, China, Costa Rica and Germany are all currently in different stages to develop energy system plans based on future energy scenarios.

Given the complicated nature of both planning the grid, acquiring the necessary permits, and constructing various elements, grid expansion in most places remains a very slow and long-term process. However, in order to reach a meaningful emissions reduction target by 2050, **we need to expand power grids now**.

Currently, governments and large energy companies manage the grid planning and construction process. In most cases, civil society is not consulted about power grid projects. Without their input, there is a **serious risk that grid expansion plans will not sufficiently prioritize environmental and climate goals**, crucial to a clean energy future.

That is why civil society must get engaged with grid planning, scenario development and environmental assessment and approval. Participation across the entire energy value chain is fundamental for citizens to understand measures and accept the costs of developing the grid infrastructure needed for a climate neutral energy system.



How is civil society currently engaged in grid development processes?

The processes for developing scenarios and grid plans are as diverse as the countries implementing them. The European planning process (Ten-Year Network Development Plan – TYNDP) involves civil society, academia, renewable energy companies and the wider energy industry. In contrast, the grid expansion plan in Japan does not involve civil society, but works with a small committee of around 20 people mainly from the grid companies itself, government representatives and academia.

In all cases, the involvement of a diversity of actors is vital for a transparent planning process and to increase public acceptance of highly visible elements of expanded grids that rely on renewable energy. For more information on civic involvement in grid planning processes around the world, see the report [Citizen Power for Grids](#).

What can I do?

Civil society can influence grid planning decisions, whether from a desire for clean air or to push for climate action. And whether you are in charge of an international non-profit, or a volunteer at the local library, your input is needed to shape grid developments.

You can:

- Get involved in your local grid planning processes by attending meetings, writing letters and engaging with the coordinators.
- Discuss with local and national politicians on how to improve public engagement in grid planning and on the value of grid development for a clean energy transition.
- Seek out local climate and environmental groups and encourage them to get involved in grid planning.
- Share this article with your network and the decision-makers listed above.

For more information, visit the PAC website: <https://www.pac-scenarios.eu/>

