World Energy Resources

Charting the Upsurge in Hydropower Development

2015

Key messages

- As a renewable energy, hydropower can serve as a **tool for climate mitigation**, where it is an accepted offset for fossil fuel technologies under UNFCCC methodologies. It can also provide **climate change adaptation services** through its ability to store water, contributing to flood control and drought alleviation in some circumstances.

- Infrastructure for hydropower projects can also be used for **freshwater management** and projects with reservoir storage generally provide a variety of value-added uses. **Multi-purpose uses for reservoirs**, including irrigation, flood control, navigation, and recreation, can help support the public acceptance of new storage projects.

- Hydropower provides **energy storage** and other ancillary services that contribute to the more efficient management of the electricity supply system and **balancing of the grid**.

- Water availability is a local issue, therefore governments must take a leading role in addressing the vicious cycle of increasing water and energy demand. **Co-operation between the energy and water sectors** is important, as is driving the operational efficiencies of the major energy and water consumers, particularly electricity generators.

- As so many water resources span across more than one country, **government decisions, policies and co-operation with neighbouring countries, are crucial to the success of such projects**. Governments further have the responsibility to ensure that sustainability requirements – economic, social and environmental – are met and that benefits, especially for local communities are realised.

- Opening up **new markets through cross-border trade and power pools** and devising appropriate market conditions, such as renewables incentives, clearer price signals for ancillary services and flexible generation, could all have a positive impact on hydropower development.

- Project developers and owners of hydropower projects will increasingly be expected to **demonstrate climate resilience** at the financial and regulatory approval stages. This may include provision of improved data analysis on climate change impacts, increased flexibility in project design to accommodate uncertainty, increased storage volumes, and revised operational regimes.

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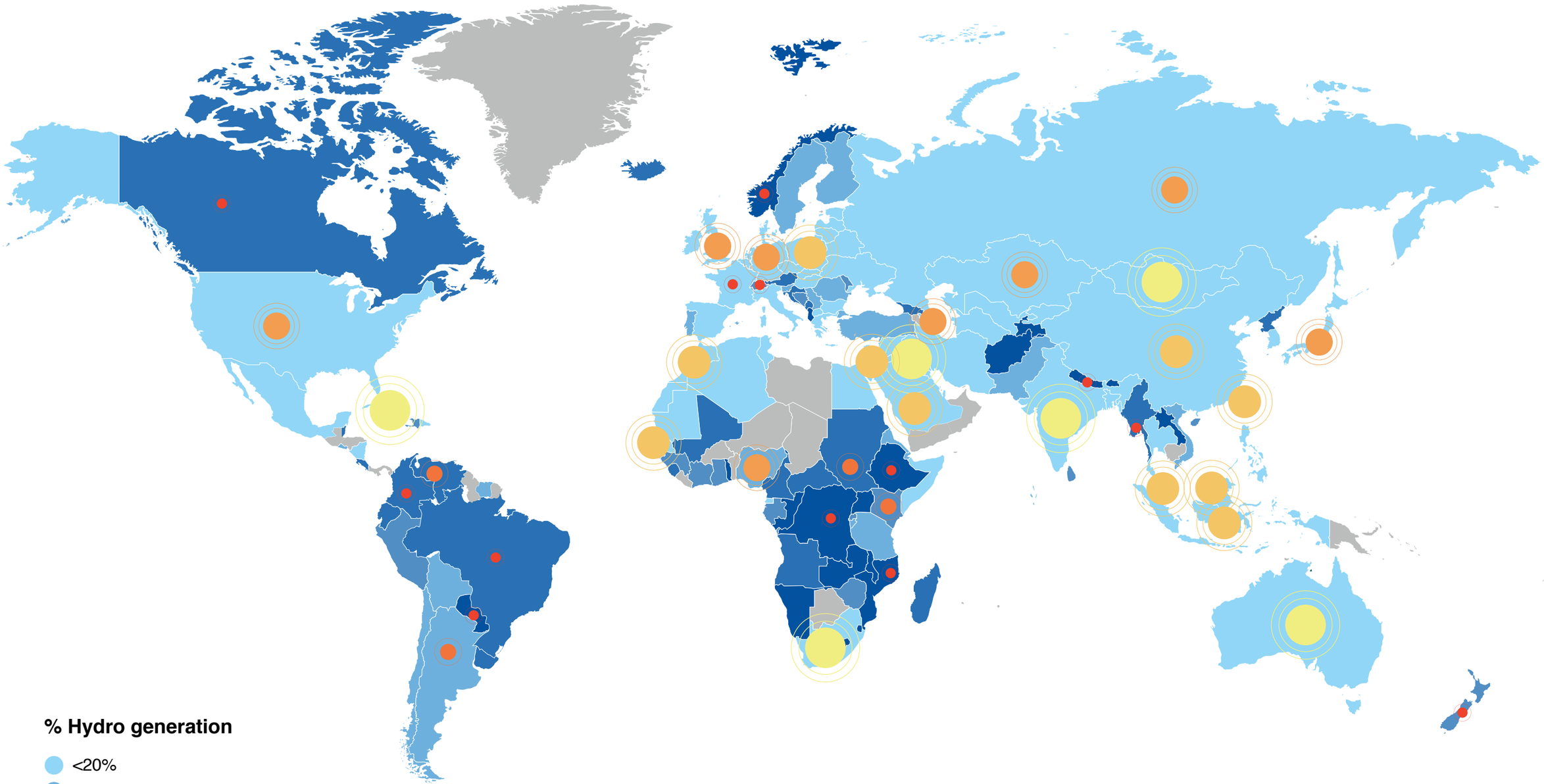
For sustainable energy.

The contribution of hydropower to a low carbon future

This map indicates the percentage of total electricity generation from hydropower in relation to CO_2 emissions from electricity generation in grams of CO_2 per kilowatt hour, for a selected number of countries. Countries where hydropower forms a higher proportion of the electricity generation mix, generally tend to have lower CO_2 emissions for electricity generation.



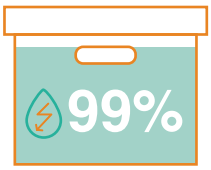
Key figures

Hydropower reached

1000GW

of total installed capacity, presenting about **half** of undeveloped potential capacity

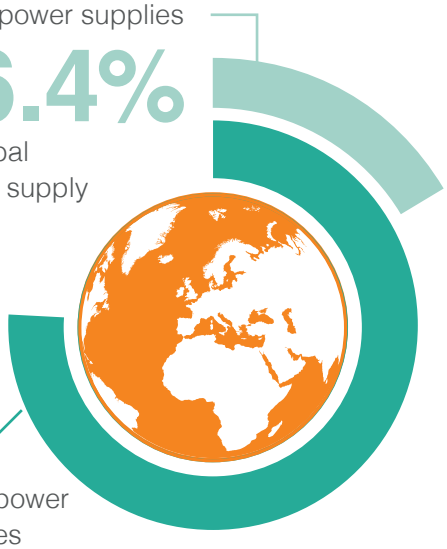
Storage hydropower (including pumped storage) represents 99% of the world's operational electricity storage



Hydropower supplies

16.4%

of global power supply

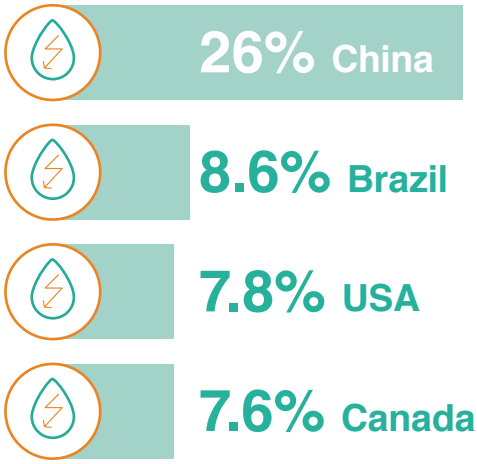


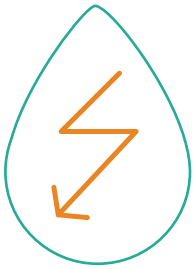
Hydropower supplies

76%

of all renewable energy

Global installed capacity:



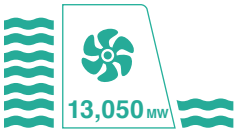


Globally, an estimated

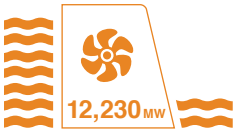
10,000 TWH/YEAR

of undeveloped hydropower potential remains for new development

The two largest hydropower plants currently under construction in the world are both over 10,000MW:



Baihetan
CHINA



Belo Monte
BRAZIL

Statistics above are based on the World Energy Resources 2015 Hydropower Status report

Find the full World Energy Resources Charting the Upsurge in Hydropower Development 2015 report and more at:

www.worldenergy.org

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