

THERE MUST BE
A SOURCE OF ENERGY
DOWN THERE

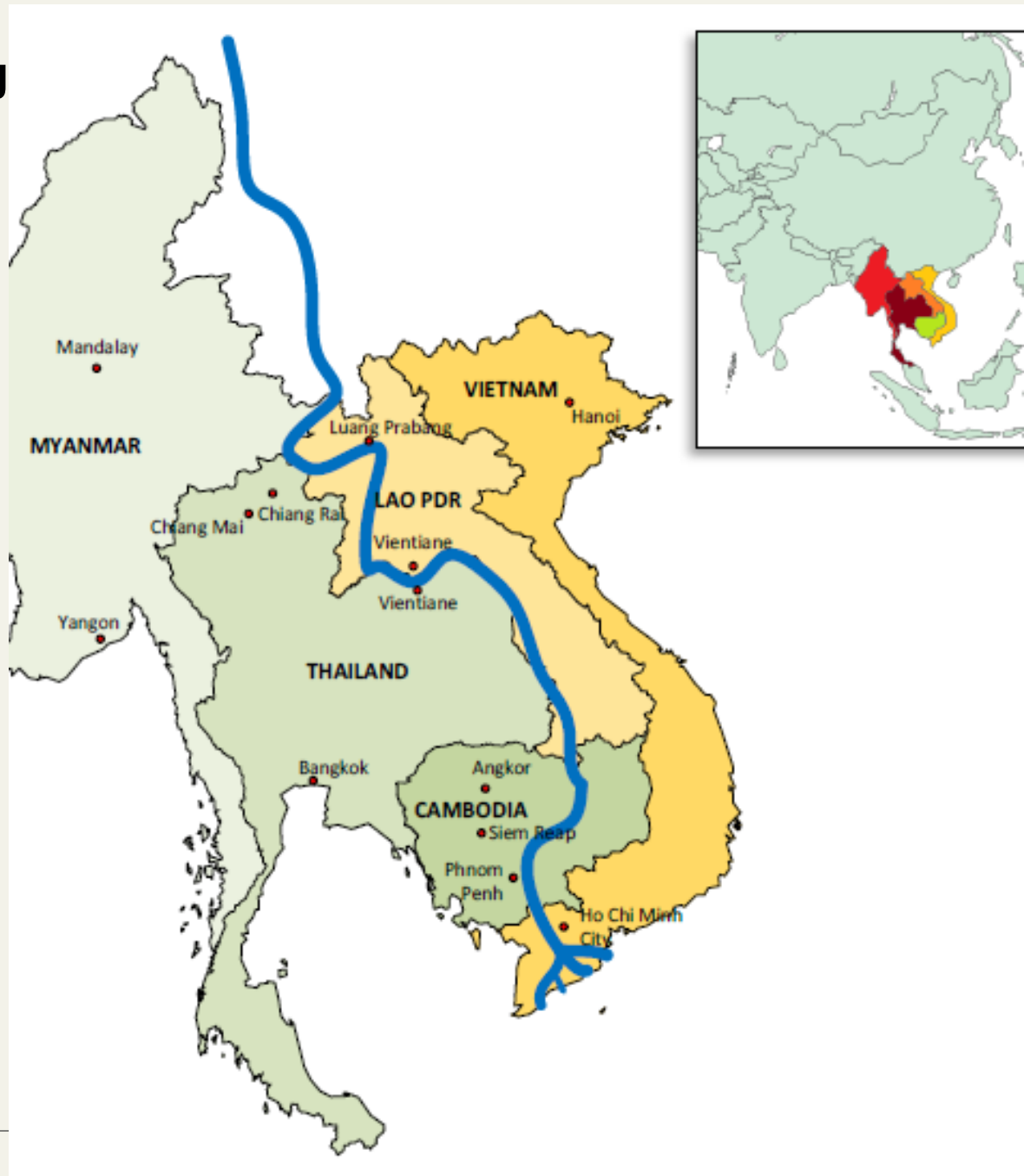


*Energy Alternatives
from a New Perspective
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WWF Cambodia*



Power Sector Vision for the Greater Mekong

- Analyze technically and economically whether the power sector can shift to a power mix largely based on sustainable renewables and efficiency.
- Multi-stakeholder project with consultations in all 5 Mekong countries
- Contribute to the debate on power development plan and future of power sector.



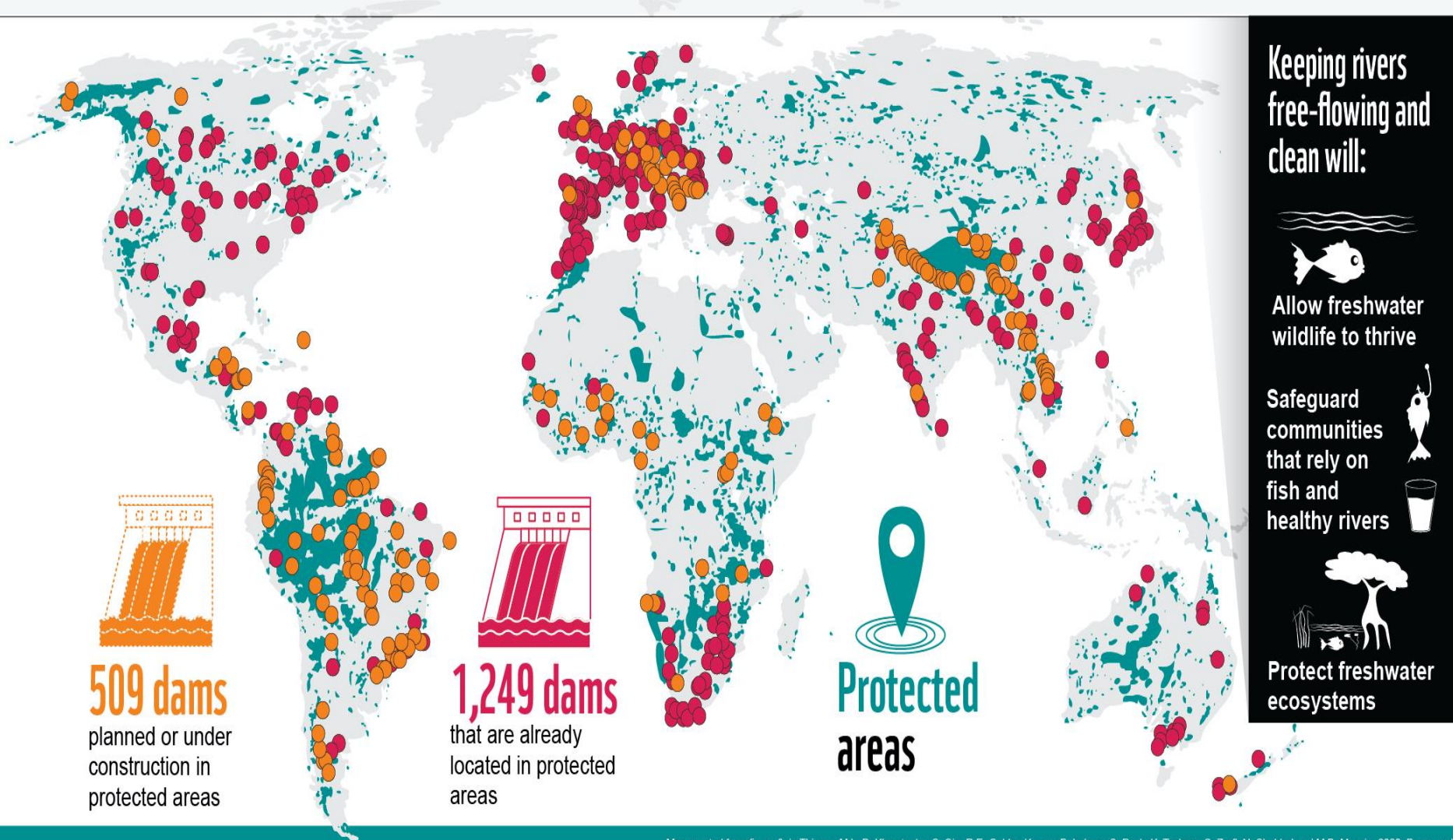


The BAU future for the power sector in the Greater Mekong

- Huge electricity consumption growth
- Hydro – not much potential left in Thailand and Viet Nam but large potential in Cambodia, Lao PDR and Myanmar – **high environmental and social impacts**
- Coal – available but poor quality and in difficult & ecologically-critical locations. Imports planned.
- Gas – over 1000 Bcm in region.
- Great wind, solar and biomass potential

Over 500 dams are planned or under construction in protected areas

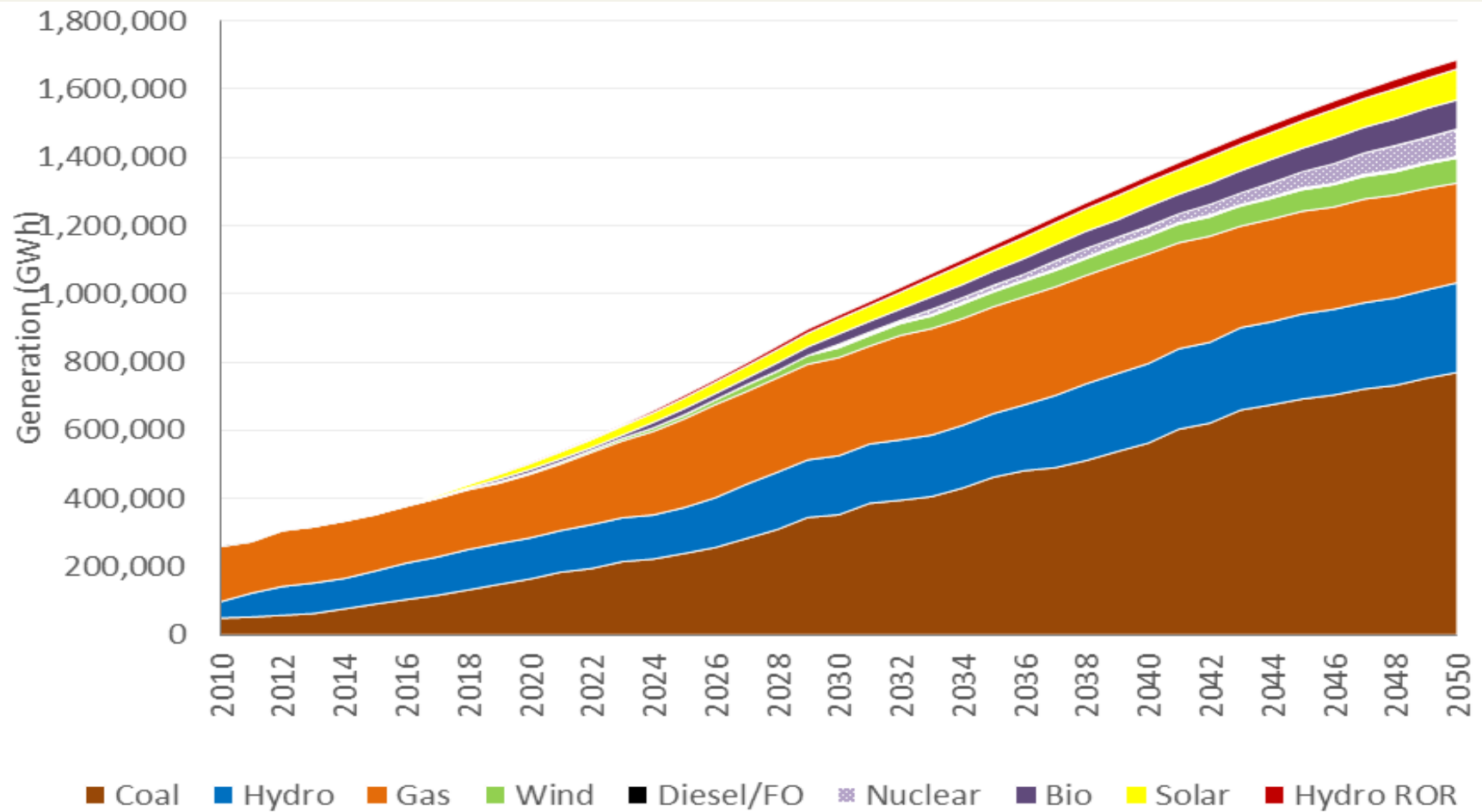
The wrong dam in the wrong place can change how a river flows and cause blockages. Species that move to find food, reproduce, or seek new habitat as the seasons change—such as salmon and river dolphins—can no longer do so. This threatens important freshwater ecosystems and people and wildlife who depend on them for survival.



Map created from figure 3. in Thieme, M.L., D. Khrystenko, S. Qin, R.E. Golden Kroner, B. Lehner, S. Pack, K. Tockner, C. Zarfl, N. Shahbol and M.B. Mascia. 2020. Dams and protected areas: Quantifying the spatial and temporal extent of global dam construction within protected areas. Conservation Letters, <https://doi.org/10.1111/conl.12719>



Greater Mekong future generation mix (BAU)

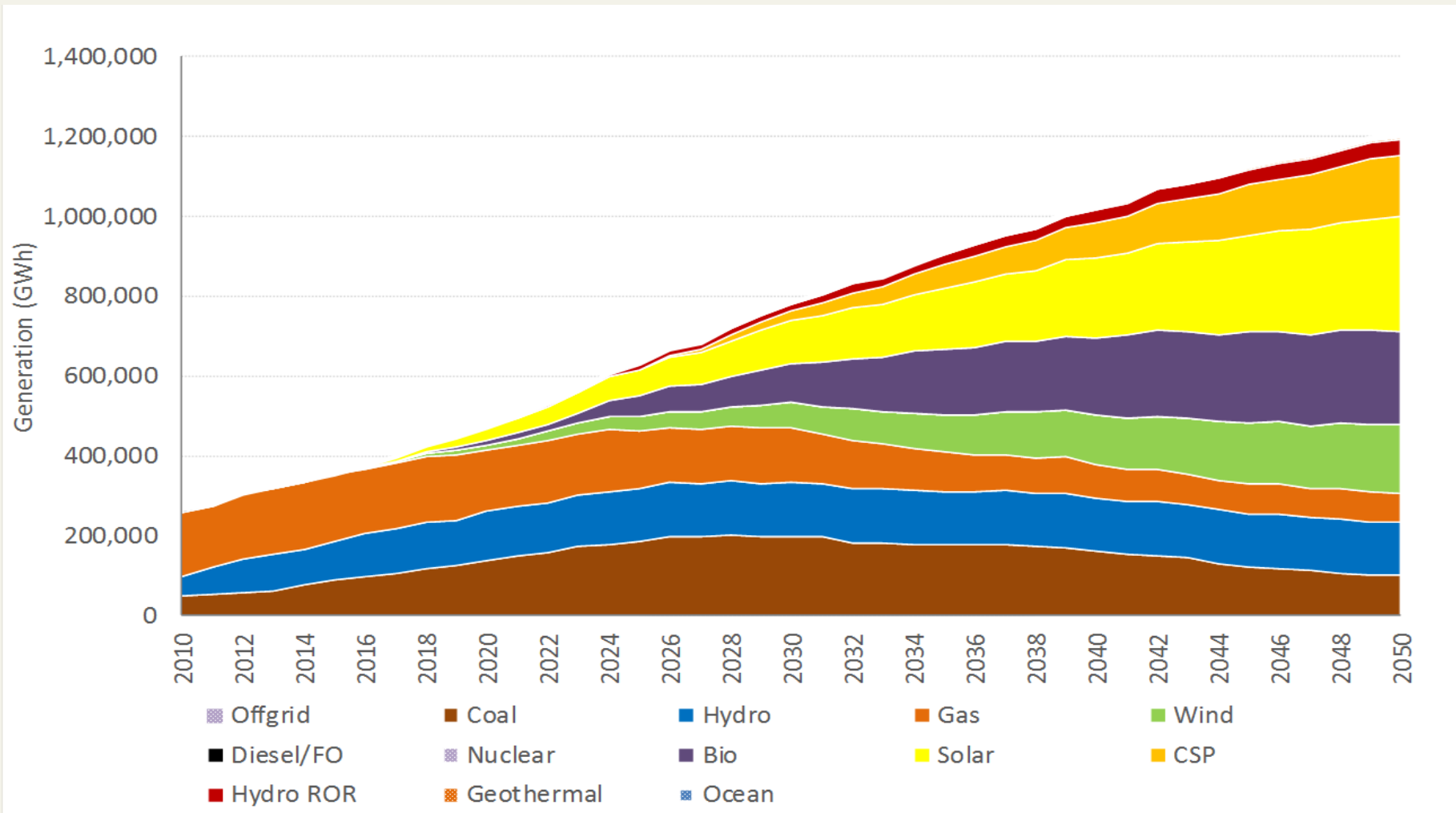


Is that a good future?

- 5.5 million premature deaths/year from air pollution (China-1.7 million/year) – WHO
- Health Impacts - \$0.014 - \$0.17/kWh (Buonocore et al., 2015)
- Over 780 million tonnes of CO₂eq emissions per year in 2050
- 50% of electricity produced with imported fuel (mostly coal) by 2050
 - Coal is the most polluting and most carbon-intensive fossil fuel

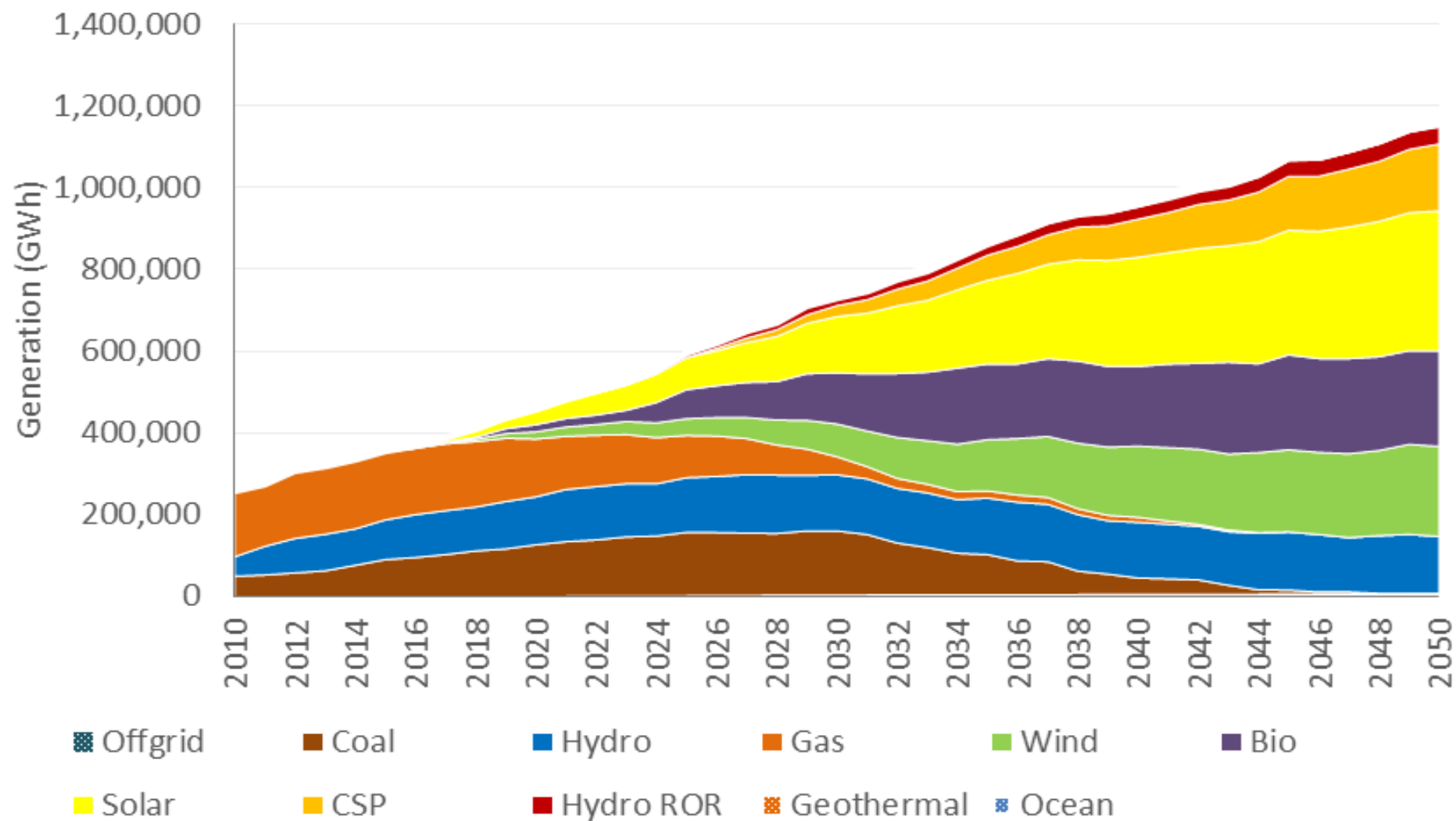


Greater Mekong future generation mix (Sustainable Energy Scenario)

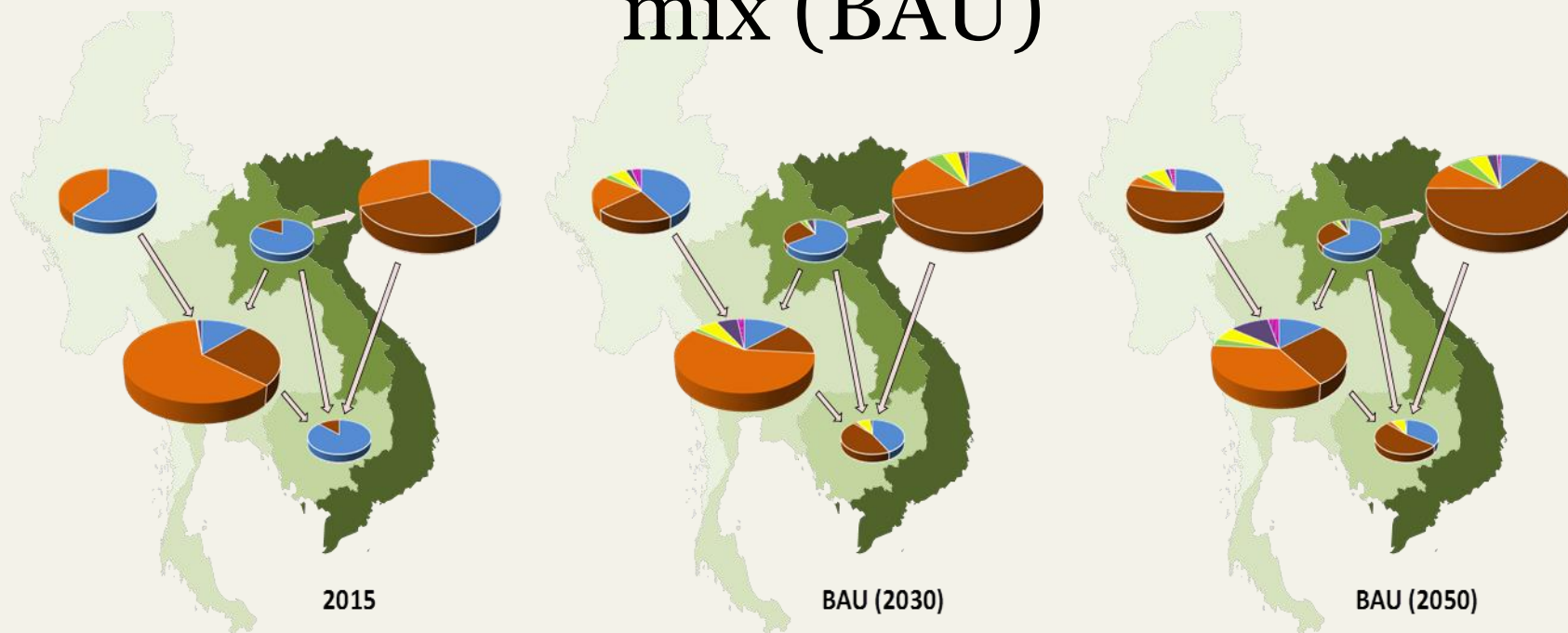




Advanced Sustainable Energy Scenario (ASES)



Greater Mekong future generation mix (BAU)



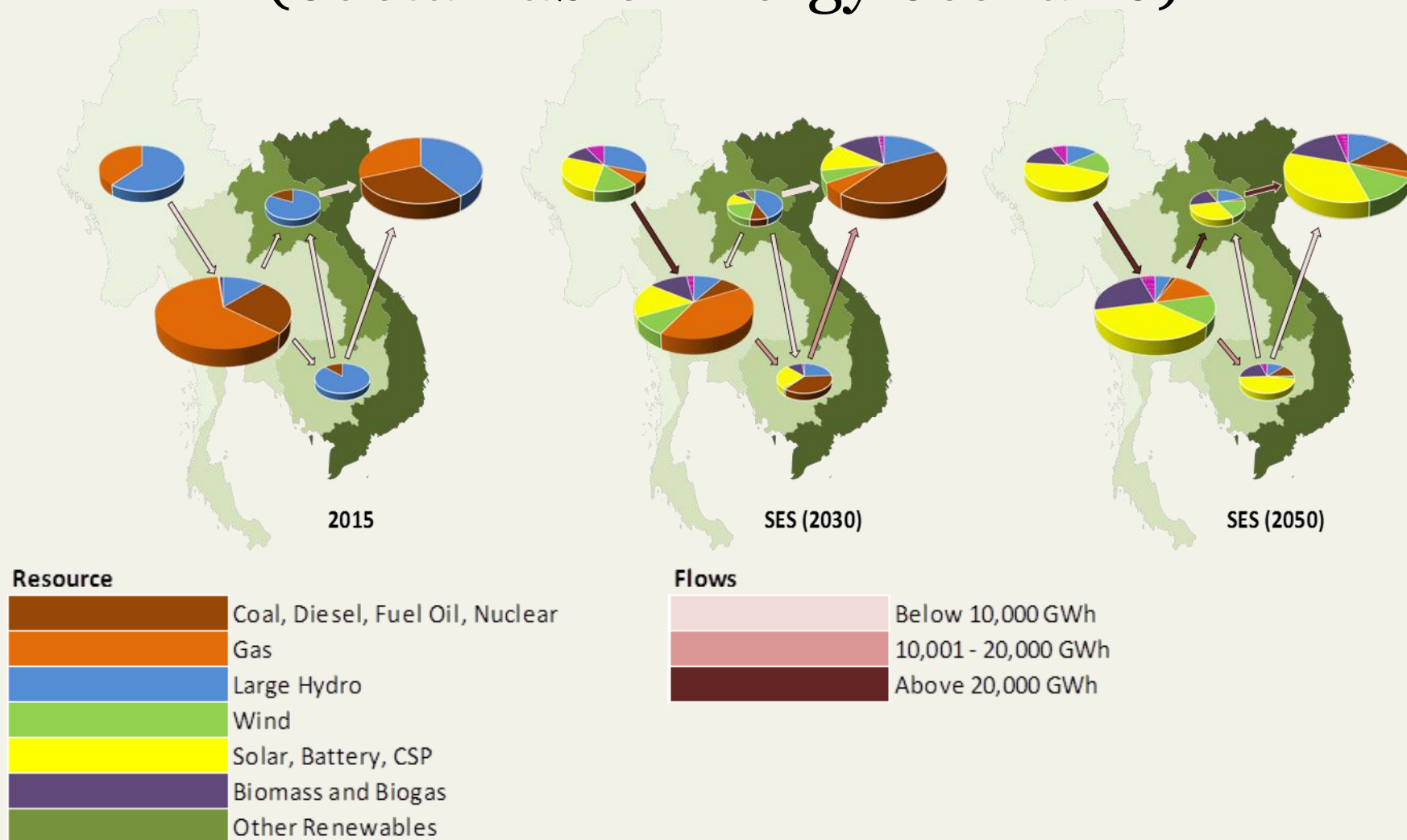
Resource

	Coal, Diesel, Fuel Oil, Nuclear
	Gas
	Large Hydro
	Wind
	Solar, Battery, CSP
	Biomass and Biogas
	Other Renewables

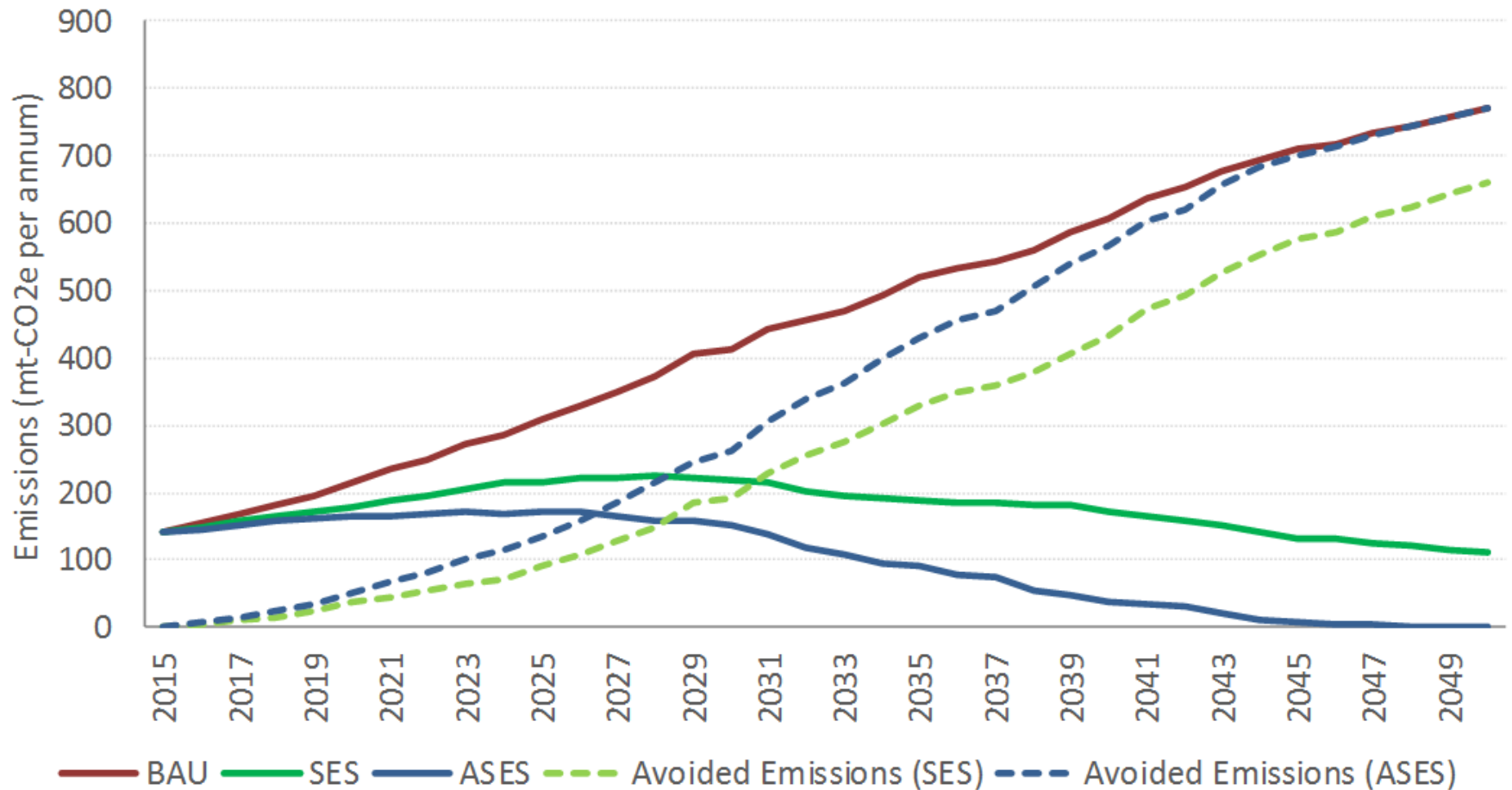
Flows

	Below 10,000 GWh
	10,001 - 20,000 GWh
	Above 20,000 GWh

Greater Mekong future generation mix (Sustainable Energy Scenario)



Avoided CO₂eq emissions



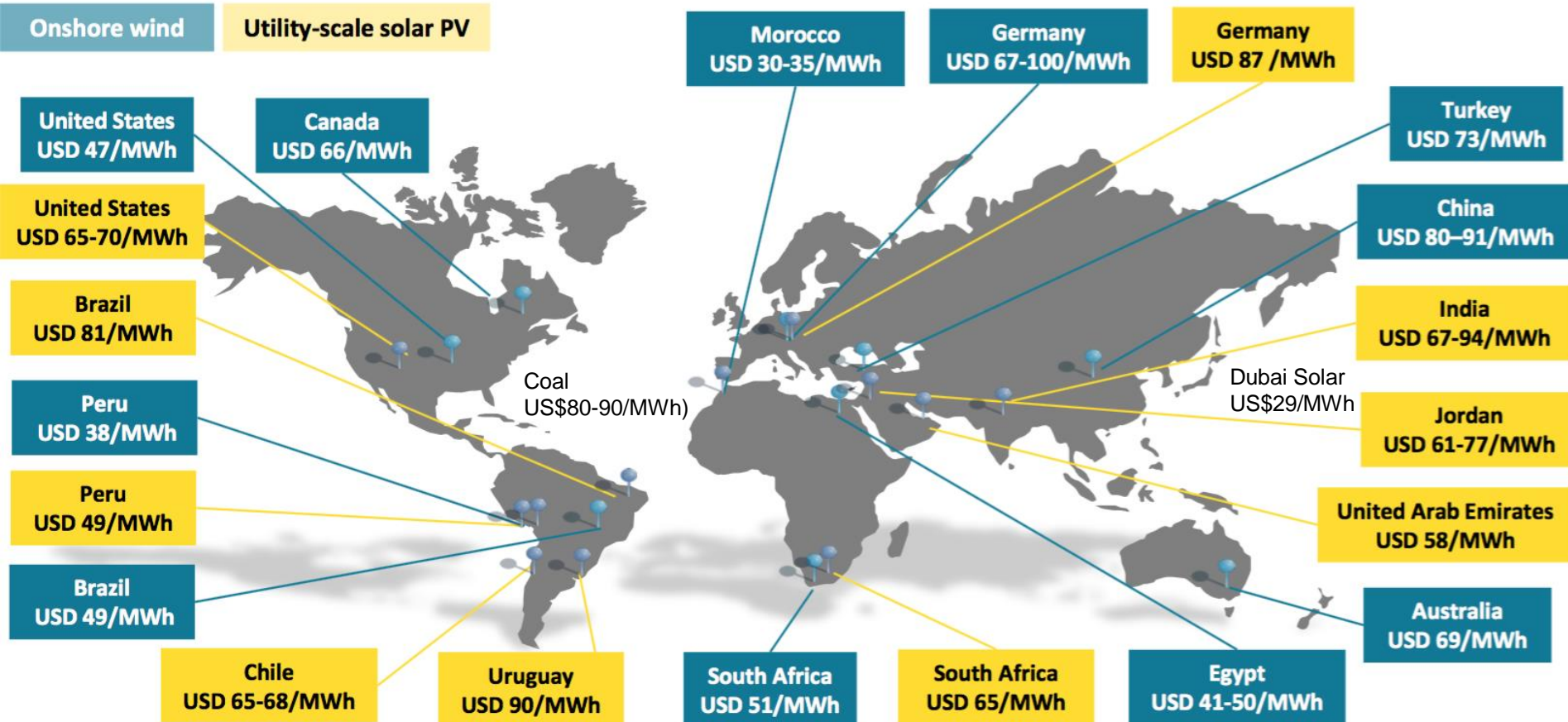
Wind and Solar PV prices declining

www.iea.org

Recent announced long-term contract prices for new renewable power to be commissioned over 2016-2019

Onshore wind

Utility-scale solar PV



This map is without prejudice to the status or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area

Note: Values reported in nominal USD includes preferred bidders, PPAs or FITs. US values are calculated excluding tax credits. Delivery date and costs may be different than those reported at the time of the auction.

Best results occur where price competition, long-term contracts and good resource availability are combined



Scenario Conclusions

- RE range is between 86% and 100% by 2050
- Carbon emissions reduced by minimum 83%
- SES Hydro increase limited to plants under construction or last phases of planning
- Additional cost to society? Higher capital costs (50% higher) will be offset by lower fuel costs = sustainable energy transition a win-win scenario
- This does not take into account social and environmental benefits – a just and sustainable energy transition has many more benefits