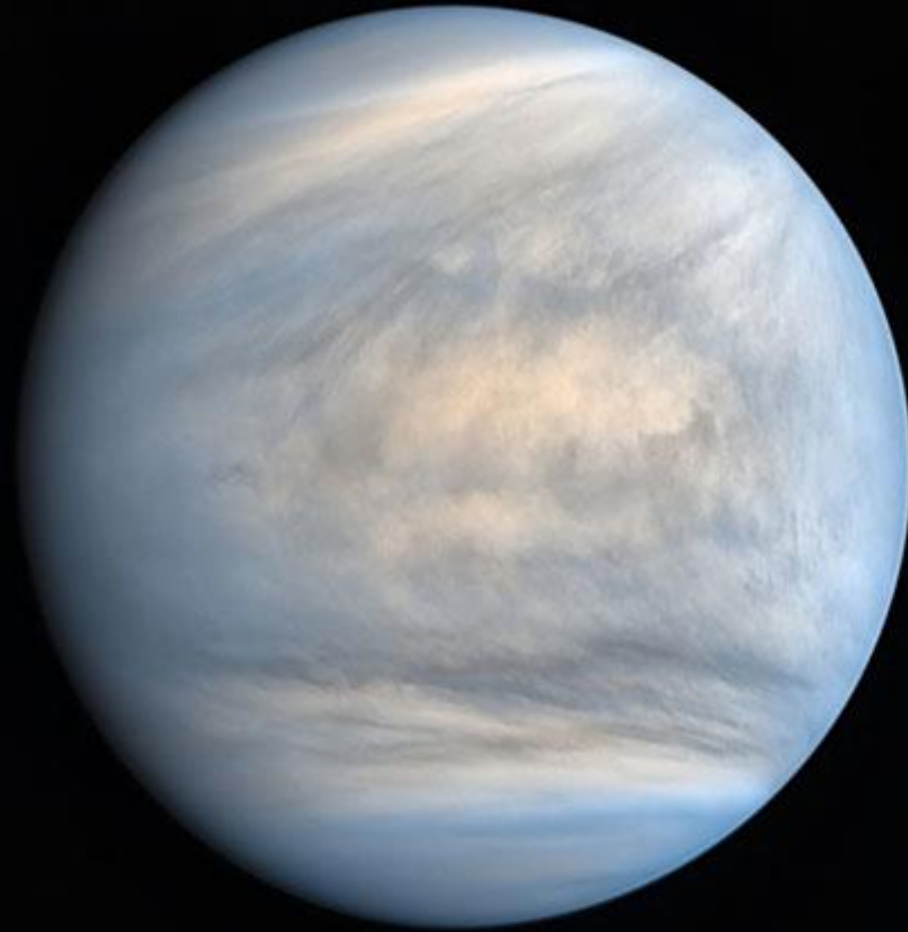


Technologies for zero carbon emissions and how to make them marketable

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October 2020, Singapore – SIEW 2020





Temperature: 470 degC

CO₂ content: 97%

Image source: JAXA / ISAS / DARTS / Damia Bouic



Globalization

Demographic change

Urbanization

Climate change

Digitalization

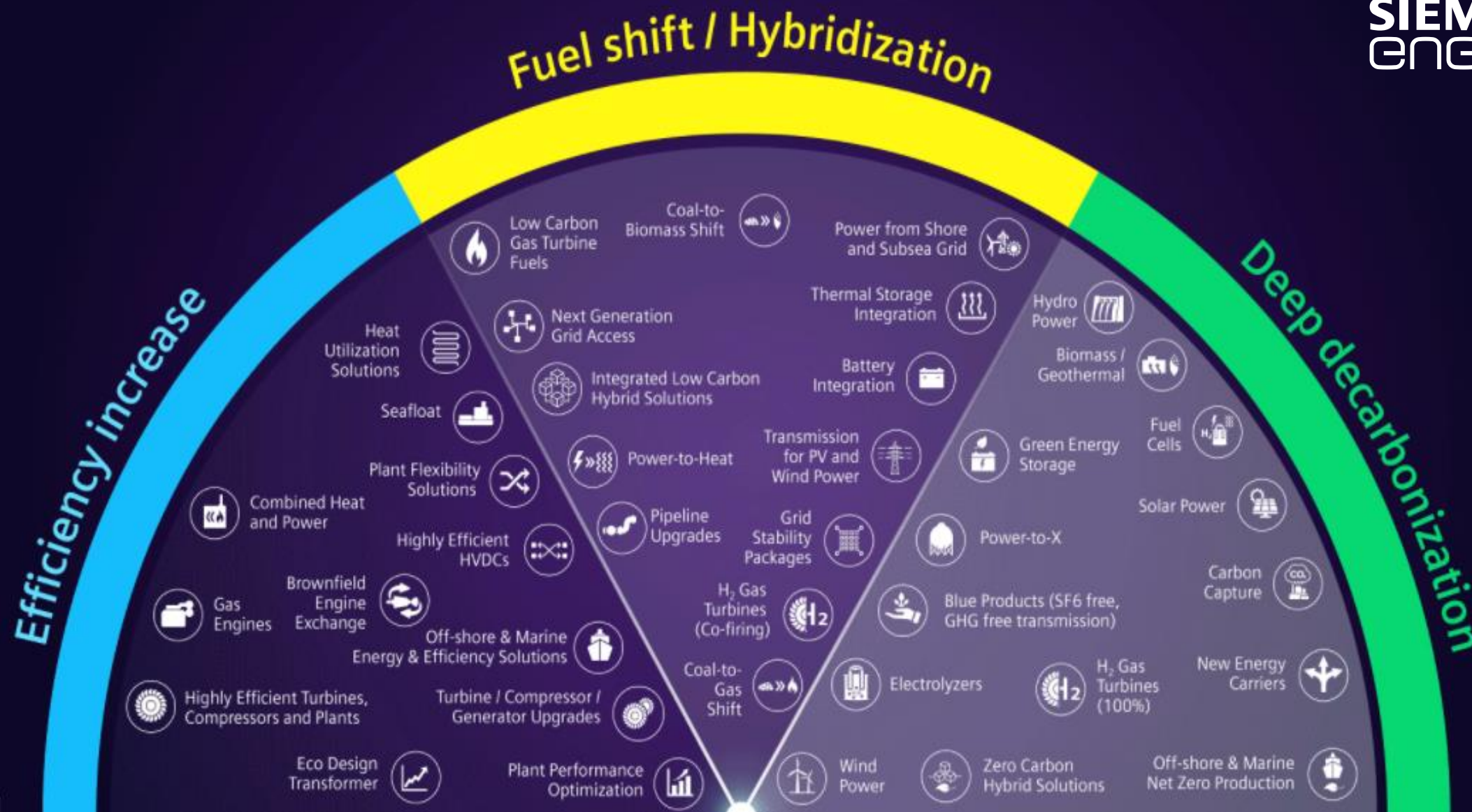
are drastically changing
our environment.

We are a world leader in energy

Present in
>90 countries

~1/6
of global electricity generation
based on our technology

>50%
decarbonized portfolio



Two examples from ASEAN

SeaFloat Estrella Del Mar III – From ASEAN for the world

- Floating power plant based on our SGT-800 gas turbine
- Highest efficiency of its class – replacing existing asset
- Integrated battery storage
- “Plug and Play” concept jointly delivered with our Singaporean partner ST Engineering
- Large portion of commissioning performed using standardized equipment under strictly controlled conditions in shipyard
- Final destination: Dominican Republic



Vietnam – Siemens Energy contribution across portfolio

- Hiep Phuoc 1 steam power plant conversion to combined cycle power plant – Using gas instead of oil
- Fifty percent lower CO2 emissions per kilowatt hour produced
- eBoP for 204 MWp PV farm incl. digital connected Sensformer® units
- Delivering wind turbines into four nearshore projects



Technology is available but can only be applied in a profitable manner with infrastructure and reward mechanisms in place

World's first

1882: commercial cogeneration plant

1884: rooftop PV array

1887: first wind turbine / 1941 first MW sized turbine

~1900: commercial electrolyzer

Recommendations (not exhaustive)

Electrify the Economy!

Sector coupling brings renewable energy from the power sector into transport, industry or heating applications: The power sector becomes the backbone of energy supply!

- Encourage use of electricity over primary fuels by de-burdening electricity tariffs from non-supply costs
- Incentivize infrastructure investments
- Energy transition as part of stimulus packages
- Support for R&D investments

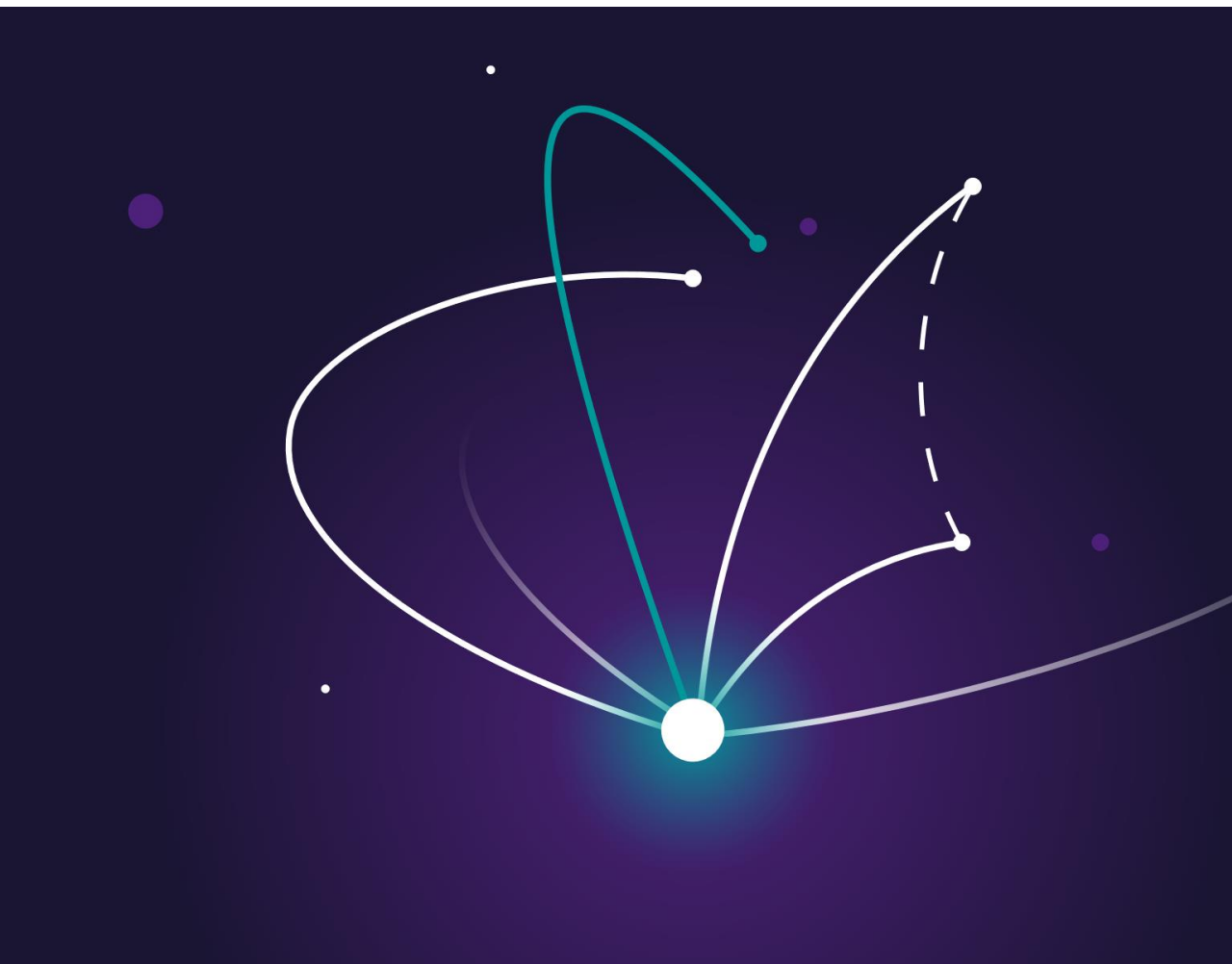
Cost & Value to be considered

Reliable power supply is indispensable: **Low/Zero carbon applications are only of value if they are available** and/or are enabled by other technologies. **Cost of integration to be considered not just LCoE.**

- Capacity mechanisms to ensure firm capacity is valued
- Reward high efficient low carbon applications e.g. CHP
- Monetization of grid services will allow for revenue stacking of existing assets (e.g. power trains) and push for commercial viability of new assets (e.g. storage, electrolyzers) → Positive feedback loop for higher share of RES

Competition of Technologies

Policy makers should be cautious deciding on the technology. Instead **create a framework where competition of technologies takes place**, such as the “polluter pays” principle.



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