

GLOBAL VALUE CHAINS AND TRANSITION TO A LOW CARBON WORLD:

Wind Energy Case

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EAST AFRICA AWARENESS WORKSHOP ON RESPONSE
MEASURES

28 August 2019

Topics covered

about the CSIR

what is the UN Secretary General call?

how does the transition look like?

what are the implications of the transition?

Case: Wind Energy

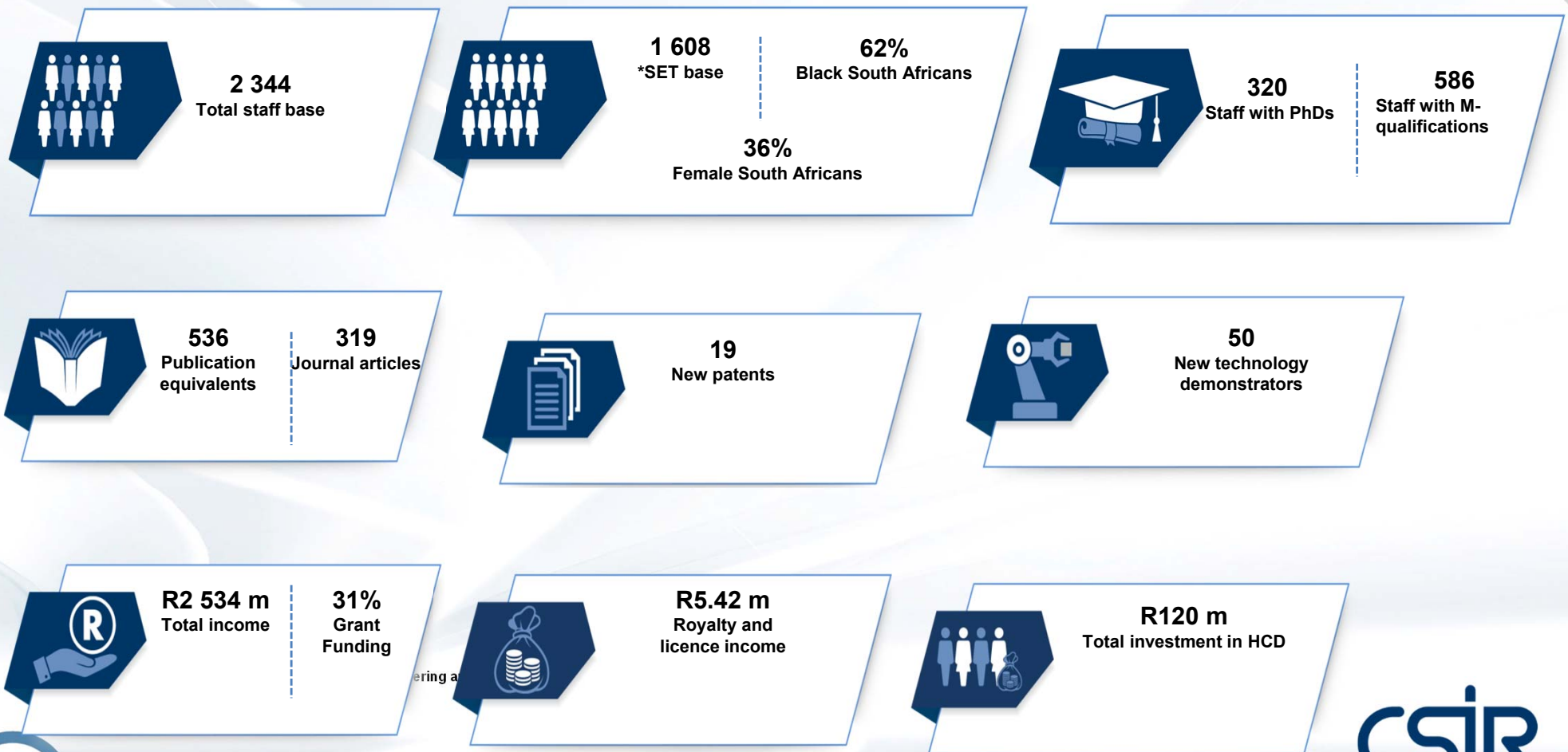
what should our countries consider?

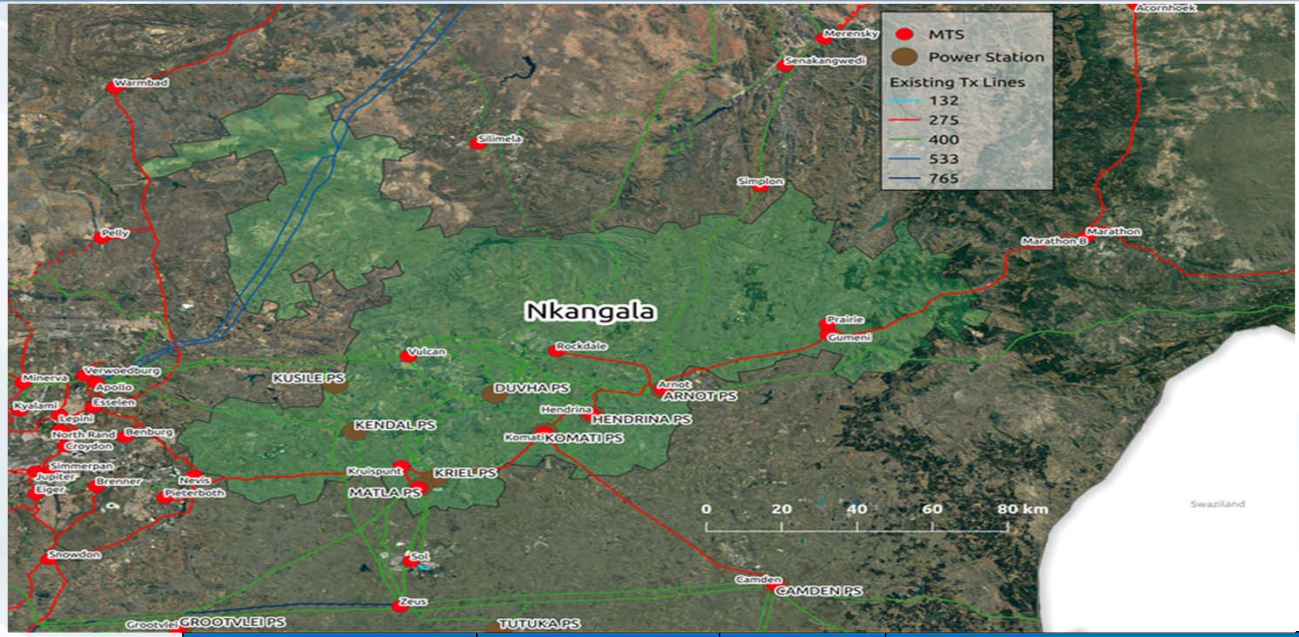
About the CSIR

The CSIR in numbers

The CSIR is a science council, classified as a national government business enterprise.

IN NUMBERS:





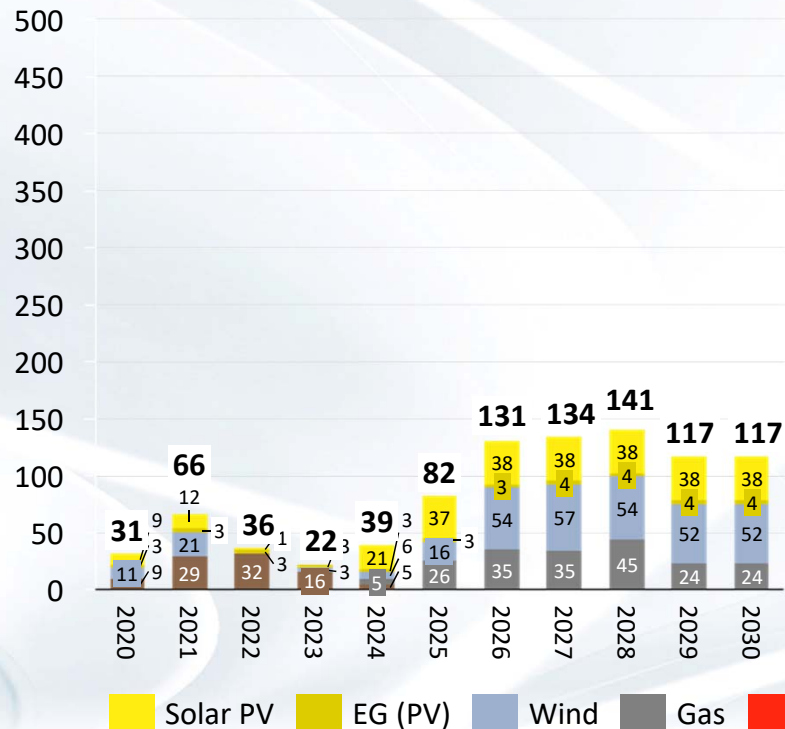
The Nkangala District region is home the bulk of power stations and coal mines in South Africa. This poses a great threat to the regional economy if these stations were to close due to decommissioning

Power station	Technology	Status	Installed capacity MW	Decommissioning date
Arnot	Coal	existing	2220	2025-2029
Duvha	Coal	existing	3480	2030-2034
Hendrina	Coal	existing	1900	2021-2027
Kendal	Coal	existing	3840	2038-2043
Komati	Coal	existing	900	2024-2028
Kriel	Coal	existing	2880	2026-2029
Matla	Coal	existing	3480	2029-2033

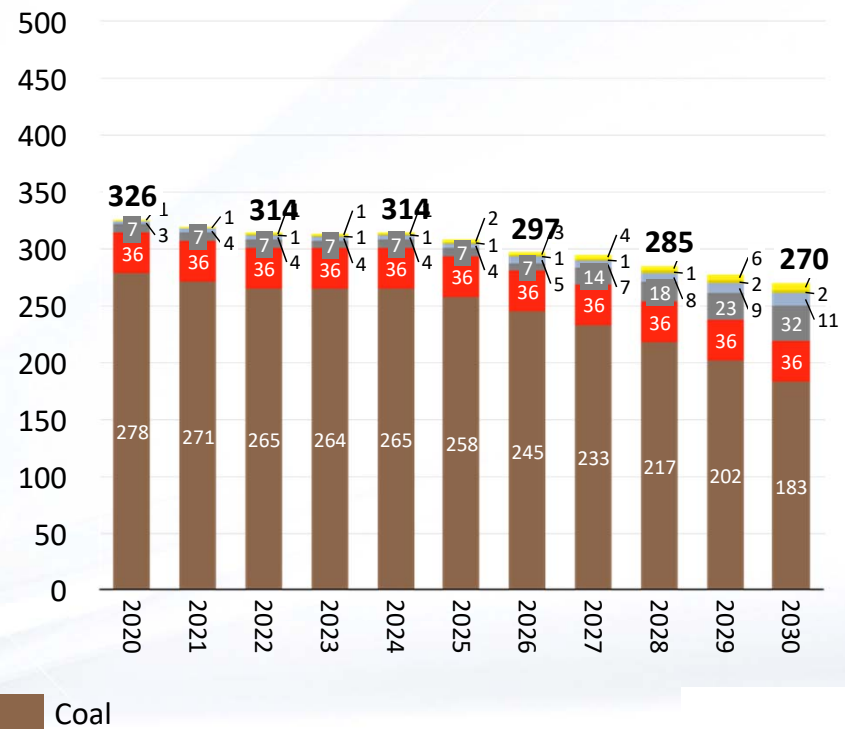
Coal dominant in jobs (as expected) but declines to 2030 in Recommended Plan as gas grows, notable gap for wind and PV

DoE
Recommended
Plan (to 2030 only)

Construction jobs
['000]



Operations jobs (net)
['000]



Sources: Draft IRP 2018; CSIR Energy Centre analysis

Note: Job potential includes direct, indirect and induced jobs; Nuclear is estimated based on existing experience at Koeberg (KPMG, 2017)



How should we understand RM?

- Analysis of the impact of the transition should not be limited to jobs and GVA; macro-economic implications, economic diversification - **Glocal**
- Investment in R&D on renewable energy technologies in developing countries; full system and storage - **Domestic**
- Global regime for capturing portions of the global value chains domestically, local minimum content - **Glocal**
- Global technology pooling for environmental technologies, defined in a global trade regime - **Global**
- Technical work by the Forum and its KCI should surface these aspects of the global transition - **Global**



What is UN Secretary General call?



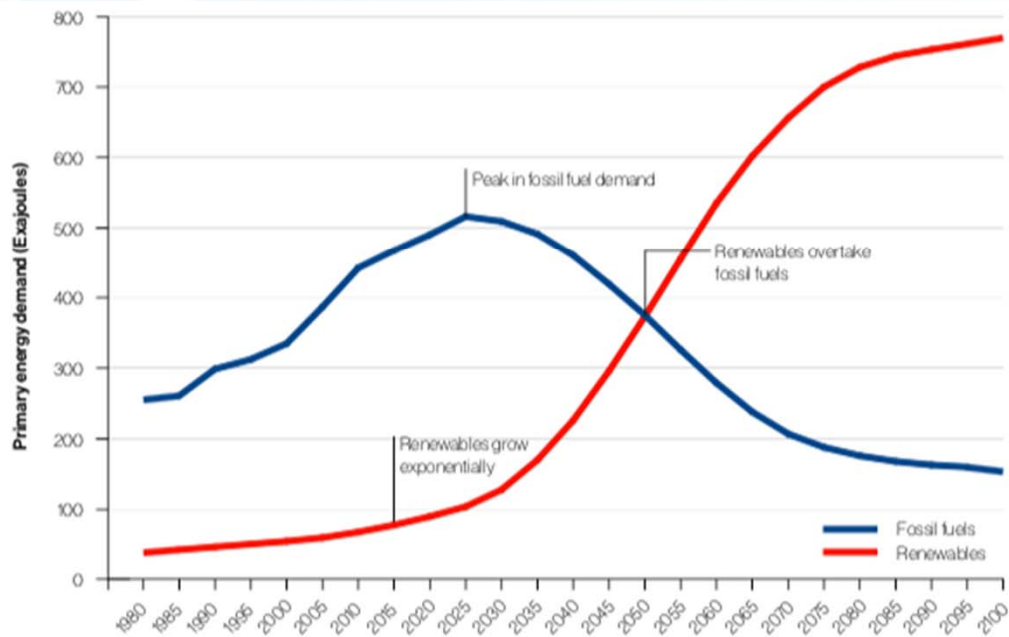
‘ ... concrete, realistic plans to enhance their nationally determined contributions by 2020, in line with **reducing greenhouse gas emissions by 45 per cent over the next decade**, and to **net zero emissions by 2050 ...**’

‘ ... these plans cannot address mitigation alone: they must show the way toward a **full transformation of economies in line with sustainable development goals...**’

‘... they should not create **winners and losers or add to economic inequality**; they must be fair and create new opportunities and protections for those negatively impacted, in the context of a **just transition.**’



how does the transition look like?



Note: This data is taken from the Shell Sky Scenario (2018), which has the merit of forecasting to 2100 and therefore projects the nature of the energy transformation over the course of the century. Other energy transition scenarios usually have shorter time horizons. The Sustainable Development Scenario (SDS) of the International Energy Agency (IEA), for example, only looks forward to 2040. IRENA's REmap scenario goes to 2050. Shell's forecast share of renewables and fossil fuels is similar to that of the IEA SDS scenario for 2040 as well as the DNV GL and Equinor Renewal scenarios for 2050. The IPCC 1.5 degree median scenario and IRENA REmap scenario anticipate a substantially larger share of renewables by 2050 with an earlier peak in fossil fuel demand.

Source: Shell Sky Scenario, 2018.

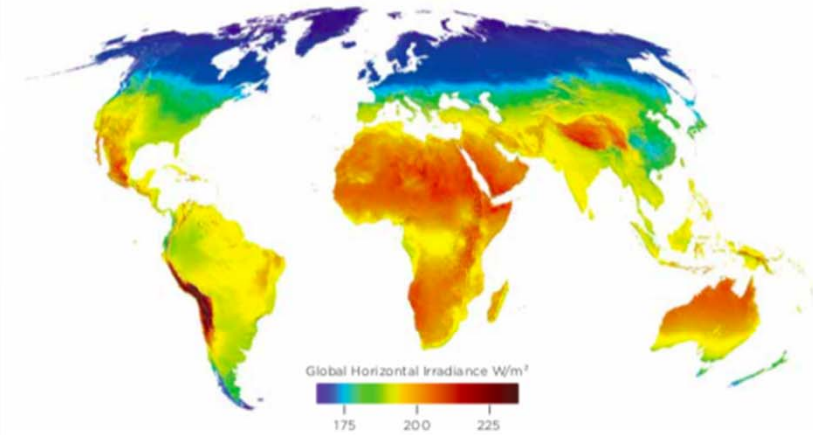
Drivers of change

- declining costs of renewables
- technological innovation
- government and investor actions
- pollution
- public opinion

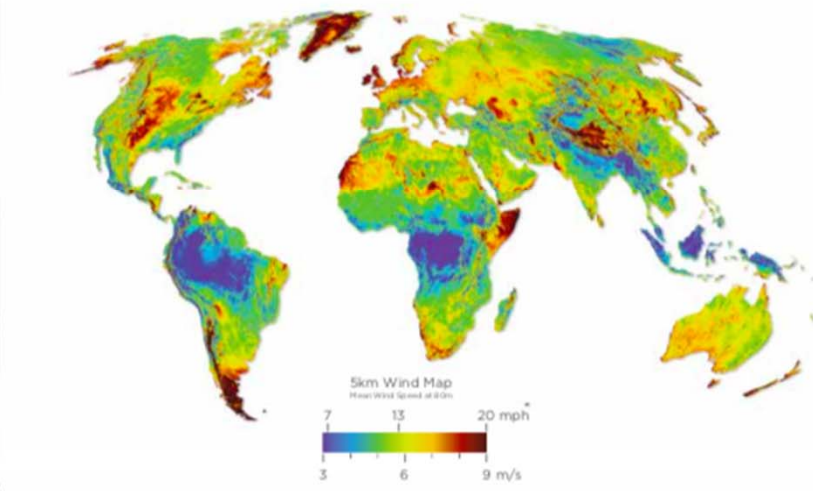
Global Commission on the Geopolitics of Energy Transformation, 2019



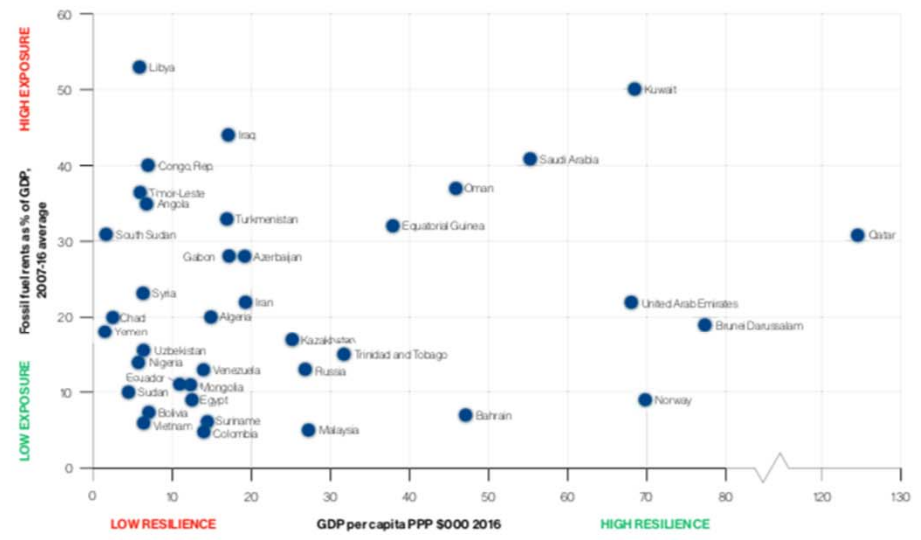
what are the implications of the transition?



Source: Vaisala.



Source: Vaisala.



Note: The chart includes countries in which fossil fuel rents account for more than 5% of GDP. The GDP of Syria dates from 2010.

Source: IMF World economic outlook database April 2018, World Bank.

Point source vs diffuse energy source

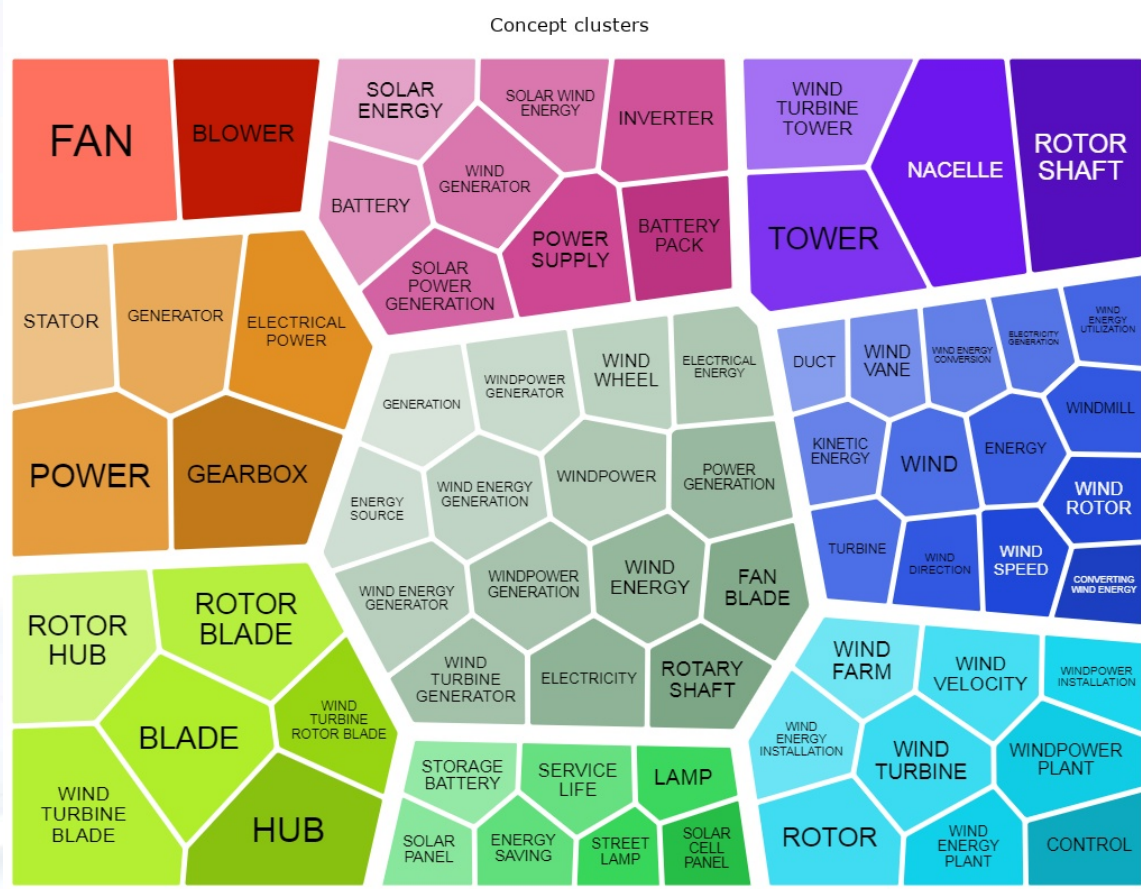
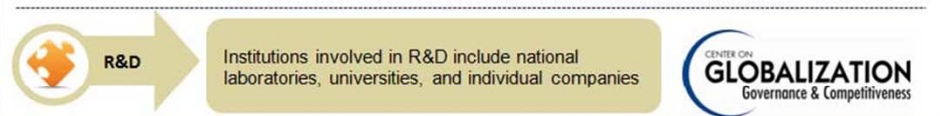
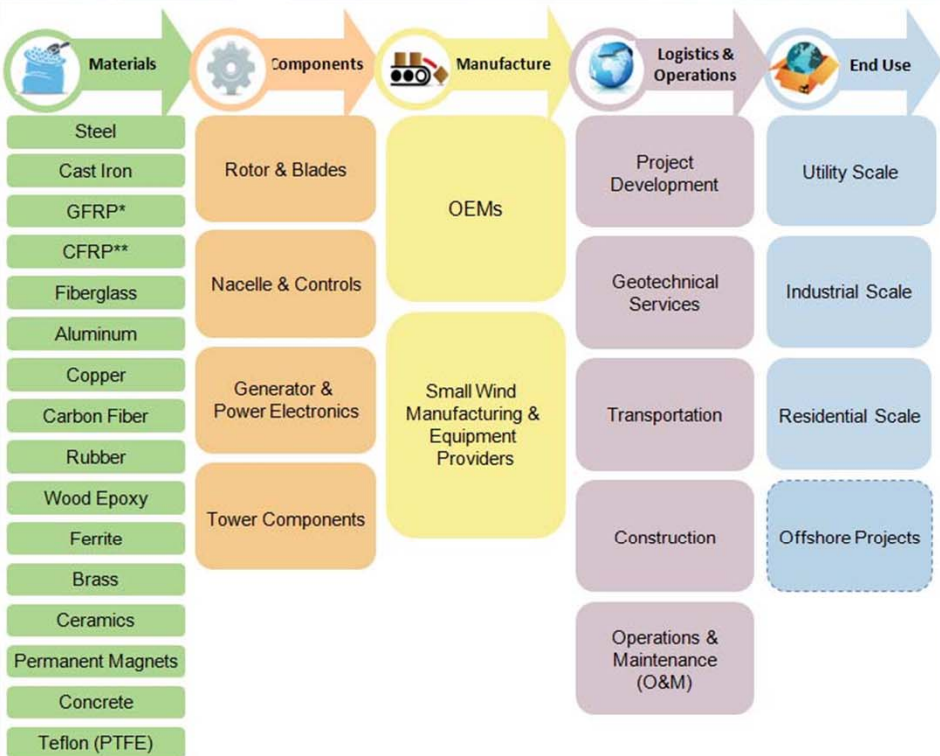
New trade patterns - RE technologies, electricity trade, renewable fuels

Corporate owned technology; globalisation effects and sovereignty

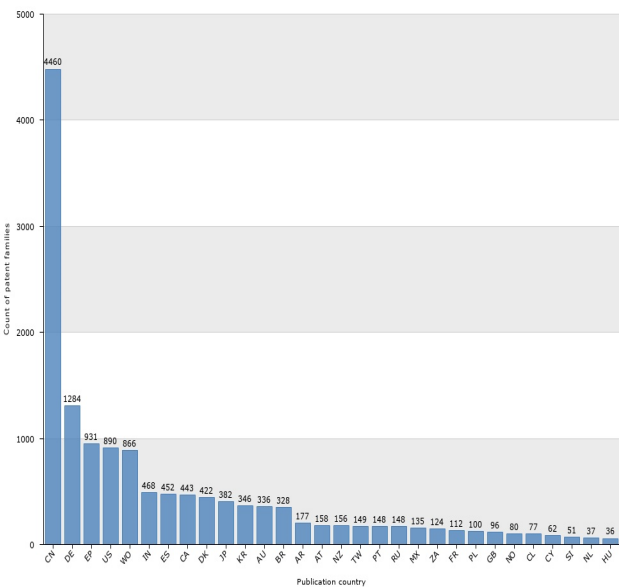
Geopolitics??



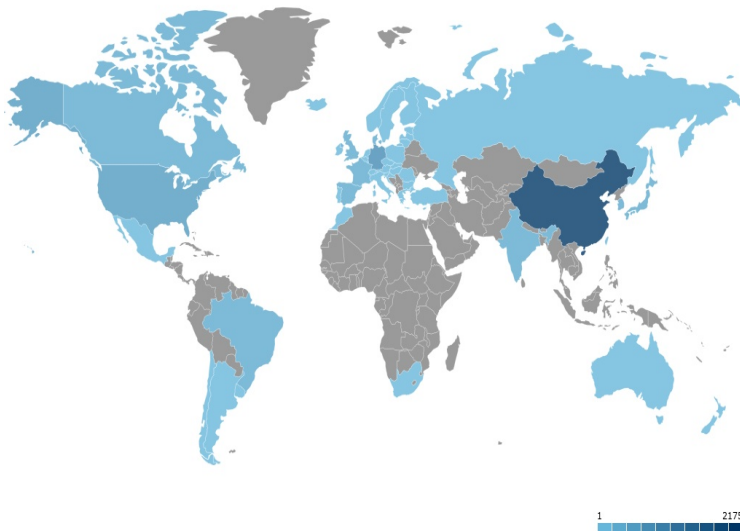
Case: Wind Energy



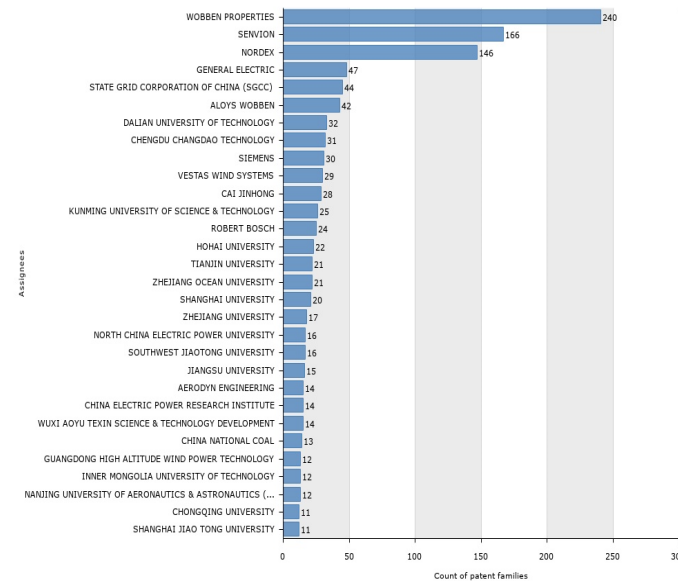
Patent families by Publication country



Markets & competitors location



Key players



KEY TAKEAWAYS

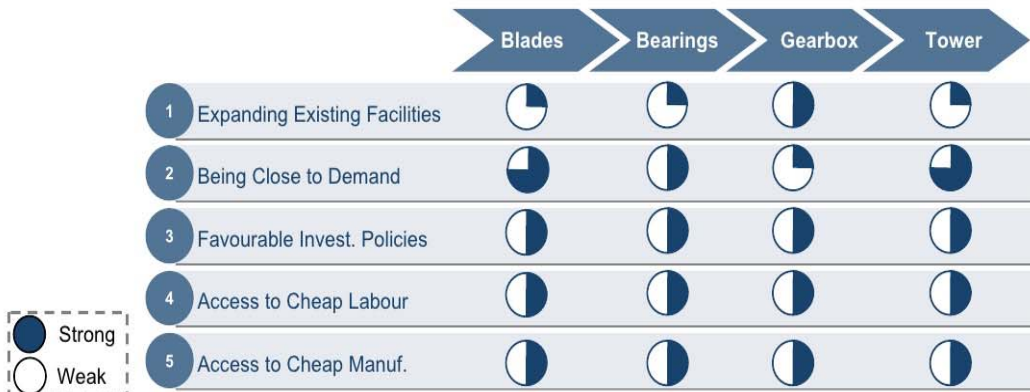
- China is leading the registration of wind energy patents; there is only one country (South Africa) in MEA with disclosed patent families
- Top 3 companies are German; 4th is American; 5th is Chinese, also constitutes more than half of top companies in wind energy technology
- The status quo will translate to **winners and losers; potentially deepen global inequality;** the question is how did the UNSG Summit address this aspect of his call?



what could our countries do?

Hot Spot Segment Assessment Summary

Overview of Investment Attractiveness: Key Location Factors for Selected Wind Turbine Components (World), 2010



Source: Frost & Sullivan

- The most important factor for the bulkiest and most expensive parts of the turbine is to be close to customers.
- Although some of the wind turbine components are technologically very complex, the factor of expanding existing facilities has not been a priority.
- Like most other production facilities, investment policies from governments such as tax credits and access to cheap labour, cheap electricity and raw materials are important to produce components for wind turbines.
- The result of this is that manufacturing facilities are moving from Europe to China, India and the US. It certainly helps that these regions are becoming more investor friendly like setting up of special economic zones and countries like China and India have lower cost labour than traditional markets of Europe.

Investment in **R&D on renewable energy technologies** in developing countries; full system and storage
Global regime for capturing portions of the global value chains domestically, **local minimum content**

Analysis of the impact of the transition should not be limited to jobs and GVA; **macro-economic implications**

Global **technology pooling** for environmental technologies, defined global trade regime

Technical work by the Forum and its KCI in surfacing these aspects of the **global transition**



Thank you