The RE landscape Vs Post Glasgow

- **Reality of commitments**
- **Three main and four inter related economy – energy considerations**
- Important geo political & climate considerations
- **Some important RE programmes**
- **By 2070, India will be 'net-zero'. 2050: US, UK, Japan, EU; ….& India expects climate finance of $1 trillion**
- Updated classification of policies for transitions Maximize socio – economic gains

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Reality of commitments

- **UNEP 2021 Emissions Gap Report : The Heat is On**
  - Updated NDCs = 7.5% off predicted 2030 emission = 2.7°C
  - Net zero commitments = 0.5°C / 55% needed to meet the 1.5°C Paris goal
- **COP26 Energy Transition Council (ETC)**
- Globally, nearly 6,900 TWh of electricity generated from RE sources in 2019 –
  - 5.5% more compared to RE generation in 2018.
- WE NEED 4X more over next ten years to avoid the harmful effects of climate change.

Three main and four inter related economy - energy considerations

https://rise.esmap.org/ https://rise.esmap.org/reports
https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Apr/IRENA_IEA_REN21_Policies_2018.pdf
https://www.esmap.org/

World economy - 2030 = 40% larger than today & Will use 7% less energy.

1. EE is critical = @ > 3X energy intensity improvements
2. Emissions reductions not limited to CO_2: + 75% fall in CH4 from fossil fuel supply fall
3. Annual additions of
   a) 630 GW of solar photovoltaics (PV) = install world's current largest solar park roughly every day.
   b) 390 GW of wind = 4X record levels set in 2020.
   c) Hydropower and nuclear, essential foundation for transitions.
   d) Evs = 5% global car sales to more than 60% by 2030.

Important geo political / climate considerations

1. Biden administration asked OPEC to step up oil production.
2. Germany's Angela Merkel to import more gas from Russia through Nordstrom 2
3. Slowing down of wind speeds in the North Sea coupled &
4. An upward trend in gas prices
   - Sharp increase in electricity prices in Europe.
   - Coal prices affect power generation in China / India

Some important RE programmes

https://ukcop26.org/focus-of-energy-transition-council-etc/

https://www.cleanenergycouncil.org.au/resources/resources-hub/clean-energy-australia-report

1. Climate Investment Funds: Coal Transition & RE Integration programmes
2. World Bank Energy Sector Management and Assistance Programme (ESMAP)
3. Sustainable Renewables Risk Mitigation Initiative (SRMI)
4. African Development Bank's Green Base-load Facility
5. South-East Asia Energy Transition Partnership
6. IEA's Clean Energy Transition Programme.

- **American Clean Power Association**
  - $1 trillion of capital investment for a majority - renewable electric grid by 2030
  - Reduce carbon emissions by over 60 percent
    - https://www.renewableenergyworld.com/policy-regulation/code-red-for-humanity-renewable-energy-advocates-react-to-u-n-climate-report/

EU green deal https://www.theguardian.com/world/2020/mar/09/what-is-the-european-green-deal-and-will-it-really-cost-1tn

At least €1 tn (£852bn) over 10 years

€503bn, should come from the EU budget,

€114bn from national governments

€279bn would come mostly from the private sector & Pledges + Phase out fossil fuels projects.

Brussels promised a €100bn “just transition” mechanism to retrain workers

Additional industry RE initiatives

- UK's Clean Green Initiative £3 billion - infrastructure and alternative technologies in developing countries
- The Regulatory Energy Transition Accelerator (RETA) of IEA was launched by International Energy Agency (IEA), Ofgem, International Renewable Energy Agency (IRENA) and World Bank.
- 23 countries, including the world's top 20 coal-fired power generating countries have made pledges to phase out coal power

•Intermittency of RE & Balancing role dynamics - an enduring problem

2020	UK	Germany
Wind	24%	23.7%
Gas	35.7%	16.1%

•**Slowing down of wind speed triggers rise in electricity prices.**

- ➢Average market price at Pound 107.50 per MWhr, September up from 96 per MWhr
- ➢Average wholesale electricity prices in Germany = Euro 128.3 per MWh = 55% increase over the previous month.

•**Renewables need to be backed by a 'balancing' power when sun is not shining and the wind is not blowing.**

➢This is provided by gas in Europe.

➢Generating assets providing balancing power have to be kept idle or operated at sub-optimal capacity when renewables are available.

- ➢**China is planning 150 new nuclear reactors online over the next 15 years.**
- ➢In India's case, nuclear power accounts for less than 2 % of the generation currently.

By 2070, India will be 'net-zero'.

2050: US, UK, Japan, EU;

2060: Saudi Arabia, China, Russia

04 imperatives & India expects climate finance of $1 trillion

- **INDIA'S SHORTER-TERM TARGETS FOR 2030**

➢ India will

1. Reduce carbon intensity of economy by 45% from 2005 levels, go beyond power sector - drive clean industrial processes
   1) Up from previous commitment of 33-35%.
   2) India emitted 2.62 billion tonnes of CO2 in 2019
   3) Projected to reach 4.5 billion tonnes in 2030.
   4) **Cut net projected carbon emission by 1 billion tonnes till 2030**
2. Ensure 500GW of RE by 2030
   1) viable storage technologies required
   2) supply chains, manufacturing and project development
      - https://www.business-standard.com/article/economy-policy/cop26-summit-economic-implications-of-india-s-emission-reduction-targets-121110300017_1.html
3. India relies on coal for 70% of electricity needs
4. Nuclear power < 2% of the energy capacity.

Other related considerations

- Agriculture accounts for 01 / 3.5 billion tonnes of carbon in India
- Draft hydrogen policy
  - By 2023 mandate 10% use of green, renewable-based, hydrogen in refineries and petrochemical plants. Up to 25% by 2026.

Updated classification of policies for transitions Maximize socio – economic gains		
Towards 2070	**Deployment (installation and generation) of RE in general**	**Deployment (installation and generation) of RE in access (including energy services)**
Direct policies **Push & Pull dynamics**	Targets, Quotas, Codes	Rural electrification, cooking, Biogas
	Pricing, Certificates, Voluntary programmes	
	Tax incentives, subsidies, grants, Tax incentives, accelerated depreciation, Concessional financing, sSupport for financial intermediaries	
Integrating policies	Enhance system flexibility (R) storage, dispatchable supply, load shaping	Integration of off-grid systems with main-grid; smart distributed energy systems ; Coupling RE policies with efficient appliances and energy services
	Ensure transmission and distribution networks, electric vehicles charging stations, district heating infrastructure, road access	
	Decarbonisation objectives into national energy plans	
Enabling policies	Level the playing field; fossil fuel subsidy reforms, carbon pricing Design of energy markets (flexible short-term trading, long term price signal) & Rliability	Industrial policy (e.g., leveraging local capacity) Trade policies (e.g., trade agreements, export promotion) Environmental and climate policies
	National RE policy Labour policies (e.g., labour-market policies, training and retraining programmes)	
	Land-use policies R & D Innovation & Public health policies	
Enabling & Integrating	Supportive governance and institutional architecture (e.g., streamlined permitting procedures, dedicated institutions for renewables) Awareness programmes on the importance and urgency of the energy transition geared toward awareness and behavioural change; Social protection policies to address disruptions & Measures for integrated resource management (e.g., the nexus of energy, food and water)	