Can the World Deliver on Its Ambitious Environmental Goals and Keep the Lights On?

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Cornelia Meyer
@MeyerResources
The Backdrop
Setting the Stage

Paris Climate Accord: 1.5 – 2°C

Fridays for Future / GT
Hightened Awareness

Affordable Energy 4 All
Clean Energy

New Technologies, AI, etc.

Policies

Growing World Population
Growing Energy Demand

Conundrum: Affordable Energy 4 All + Achieve Paris Climate Goals
→ Can Only Be Achieved Through Technology, Policies, Investment & Champions
The Steps
Need To Identify What Has Most “Bang For Buck”
The World As Is
Primary Energy Demand 1970 - 2014

Growth Until 2040 – How To Achieve Climate Goals?

Source: BP Statistical Review
Primary Energy Demand: Change in Relative Shares

Will Not Achieve A Carbon Neutral World By 2050

Source: BP Statistical Review
Environment
CO2 Emissions

• 52 GT

• Current trajectory: 52 – 58 GT in 2030

• For 1.5 °C: 25 – 30 GT in 2030

• Net 0 emissions by 2050

Only Possible With Massive Technology Deployment Across The Globe
CO2: The Culprits

Annual share of global CO₂ emissions, 2016

It Is About China, North America, India & Russia

Source: OWD
The Culprits: Per Capita

CO₂ emissions per capita, 2016

It Is About North America, Australia & GCC

Source: OWD
The Culprits: Sectors

Carbon dioxide (CO₂) emissions by sector or source, World

- Electricity and heat production
- Manufacturing industries & construction
- Residential buildings & commercial and public services
- Other sectors

Source: World Bank
We Are At The Beginning ➔ A Lot Can & Will Have To Be Done
CO2 & Power Generation

How are new players in power generation affecting the global carbon intensity of electricity?

Share of global power generation

CO2 intensity

US, China & India Is Where It Is At
Technologies / Companies
To Achieve Paris Climate Change Goals

• Energy:
  1) Renewables: PV / wind
  2) Nuclear
  3) Hydro
  4) How long do we need oil, gas & coal?

• Buildings:
  1) Retrofitting
  2) Smart buildings
  3) Smart cities

• Smart Grids / AI

• Transportation (mind poverty trap)

• Food & consumption / supply chains (mind poverty trap)

Decarbonization & Digitization  →  Surge In Electricity Demand
Champions

Industrial / Energy Companies:

- ABB, Vestas & Co
- Schneider Electric
- Siemens
- Utilities
- GE Sempra
- Mitsubishi, etc.
- J Hanwa, Guodiang Minyang
- Masdar
- Car manufacturers
- Battery Manufactureres BYD
- Rolling Stock
- BP Shell

Oil /energy & industrial companies need to reinvent themselves think broader
⇒ integrated systems suppliers

⇒ Condition: reliable electricity supply

Need Reliable Energy Companies, OEMs & Utilities
Economic Performance of Utilities

Share Price of German Utilities

OEMs & Utilities Need To Be Allowed to Be Profitable
Policies
Policies

Europe:

Energy:
- EU: 2030 Energy Strategy:
  - 40% emissions reduction compared to 1990
  - 32% renewable energy
  - 32.5% increase in energy efficiency
- Energiewende

Buildings:
- Strict building codes:
  - Retrofitting
  - New building materials:

Transportation:
- Strict emissions standards:
  - EU 2020 renewables strategy
  - Dieselgate :costs

Some outcomes not desirable

World:

Energy:
- China: 20% renewable energy by 2030 /15% by 2020
- India: 100 GW of solar power by 2030 / double nuclear
- Ambitious renewable projects Masdar, New Saudi & other champions

Buildings:
- Smart buildings (China, UAE / Masdar, etc.)
- China: 500 of 100 global smart cities
- India smart cities programme retrofitting
- KSA Great Opportunity?

Transportation:
- Mass transit
- EVs hybrids, etc.

Ensure Policies Are Thought Through

Policies Need To Take Into Consideration Full Lifecycle Cost & Environmental Impact
**Prescriptive Policies:**
- Clear guidelines & bans
- Example: heating systems

**Elective Policies:**
- Incentives (financial)
- Example: heating systems

**Financing:**
- No / reduced investment in ff
- Example: Norway SWF
- ESG investing

**Financing:**
- Investing in technology
  (Bill Gates)
- ESG investing
Conclusion
Conclusion

Achieving CC goals of Paris Accord → will affect every aspects of our lives

Global task

Mindful approaches needed → realistic stretch goals

Massive investments needed

In Order To Achieve Goals: Need To Change Lives & Companies Need To Rethink / Reinvent Themselves & Allowed To Generate Returns
Thank You!
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