The Role of PV For All in a Net Zero World

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NZE requires a paradigm shift in energy supply and use

By 2050 total energy demand decreases while the global economy is more than twice as large as in 2020. Renewables and nuclear power displace most fossil fuels in the NZE, whose share falls from 80% in 2020 to just over 20% in 2050.
NZE: Make the 2020s the decade of massive clean energy expansion

Technologies for achieving the necessary deep cuts in global emissions by 2030 exist, but staying on the narrow path to net-zero requires their immediate and massive deployment.
Set near-term milestones to get on track for long-term NZE targets

- **Buildings**: No new sales of fossil fuel boilers
  - 2020: No new unabated coal plants approved for development
  - 2030: Phase-out of unabated coal in advanced economies
  - 2040: Net zero electricity sector globally
  - 2050: Almost 70% of electricity generation globally from solar PV and wind

- **Transport**: Electric cars are 60% of sales
  - 2020: Electric cars are 60% of sales
  - 2030: All new buildings are zero-carbon ready
  - 2040: Half of heating demand met by heat pumps
  - 2050: More than 85% of buildings are zero-carbon ready

- **Industry**: Most innovative low-emissions technologies in heavy industry demonstrated at scale
  - 2020: Universal energy access
  - 2030: All industrial electric motors are best in class
  - 2040: 50% of fuels used in aviation are sustainable
  - 2050: More than 90% of heavy industry production is low emissions

- **Electricity**: Net zero electricity sector globally
  - 2020: Phase-out of all unabated coal and oil power plants
  - 2030: Half of existing buildings retrofitted to zero-carbon ready levels
  - 2040: Almost 90% of buildings are zero-carbon ready
  - 2050: More than 90% of heavy industry production is low emissions

- **Other**: Universal energy access
  - 2020: Overall net zero electricity in advanced economies
  - 2030: 4 Gt CO₂ captured
  - 2040: Net zero electricity sector globally
  - 2050: 7.6 Gt CO₂ captured

- **Energy Transitions**:
  - 2020: 1020 GW annual solar and wind additions
  - 2030: 435 Mt low-carbon hydrogen; 3 000 GW electrolysers
  - 2040: 150 Mt low-carbon hydrogen; 850 GW electrolysers
  - 2050: 435 Mt low-carbon hydrogen; 3 000 GW electrolysers
Electricity leads the way to net zero

In our net zero pathway, renewables make up nearly 90% of electricity generation in 2050, propelled largely by solar PV and wind. More than 12 000 TWh are utilized to produce merchant hydrogen.
Scale up solar PV and wind massively

Solar PV needs to grow 20-fold and wind 11-fold from 2020 to 2050.
A surge in clean energy investment is needed to change course

Clean energy investment has been stuck at less than $150 billion in recent years, but needs to expand by more than seven times, to above $1 trillion, in order to put the world on track to reach net-zero emissions by 2050.
Renewables accelerate but still well below Africa’s potential

Despite faster growth of solar PV in 2021 and 2022, Africa’s share in global renewable expansion remains very limited as the availability of affordable financing and policy uncertainty remain key challenges.