



USAID
FROM THE AMERICAN PEOPLE

Workshop on Renewable Energy Integration and Procurement

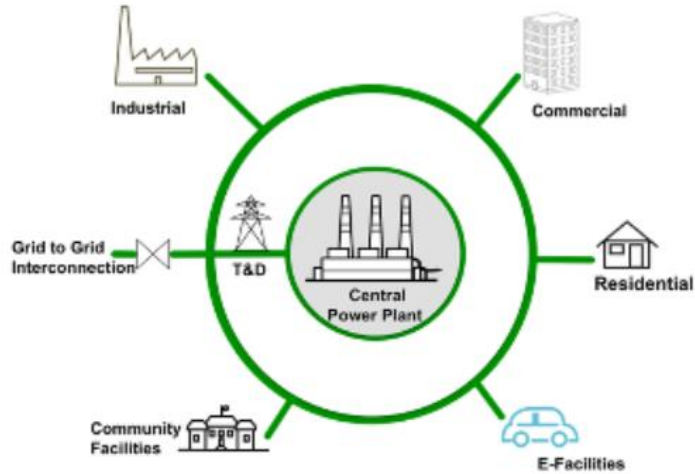
March 18 -19, 2024

South Asia Regional Energy Partnership (SAREP) and Sri Lanka Energy Program

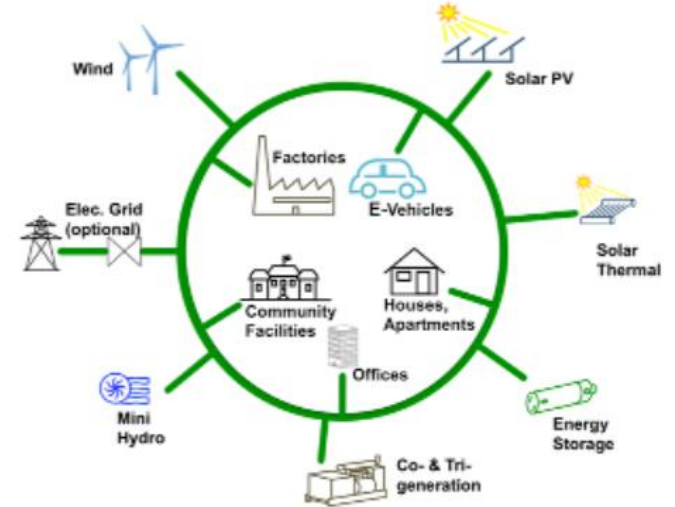
Session 5: Distributed Renewable Energy Outlook- Programs, Schemes and Targets



Introduction to DRE



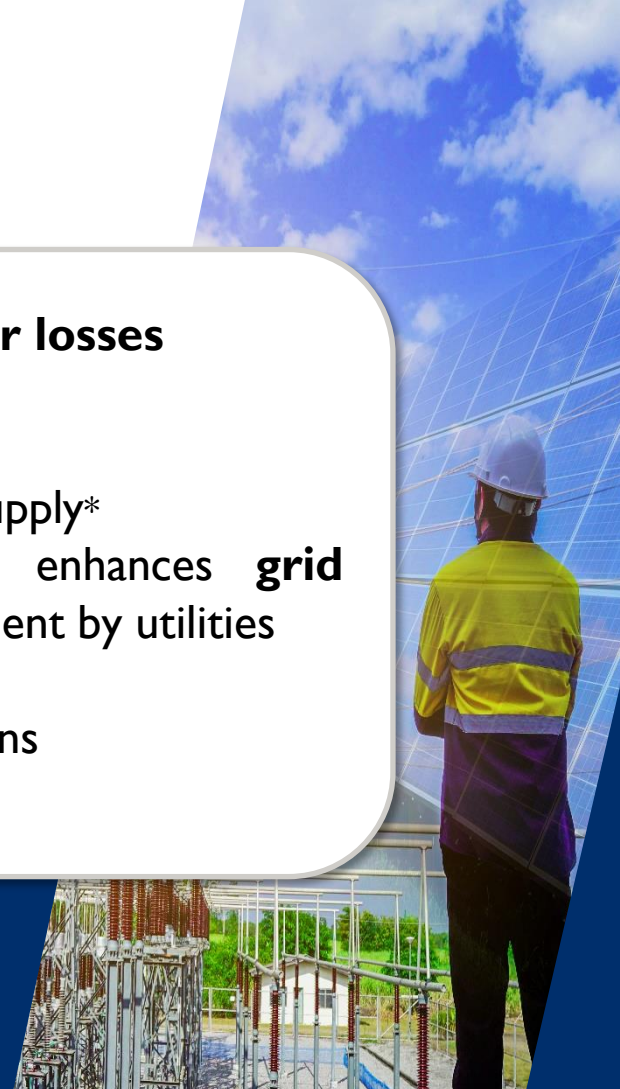
From: "Grid Centric"



To: "Customer Centric"

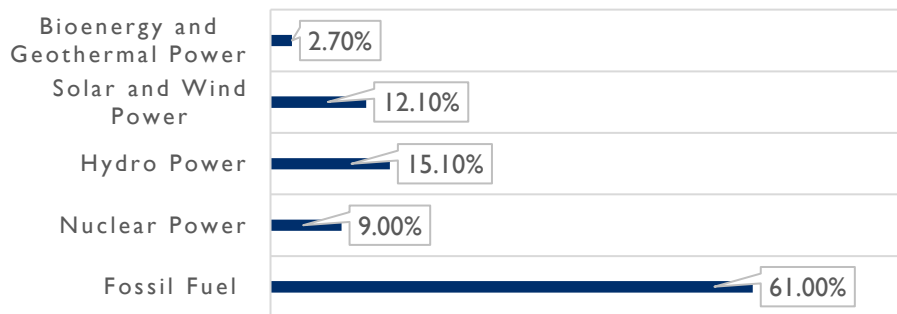
Significance of DRE

- **Reduced transmission** distance and reduced **power losses**
- **Flexibility** and speed of solution deployment
- **Security** of power supply
- Reasonably **lower cost** than traditional centralized supply*
- Distributed energy storage integrated with RE enhances **grid flexibility, reliability**, and benefits demand management by utilities
- Comparably **Easy to operate** and maintain
- High energy efficiency and fuel-free renewable solutions

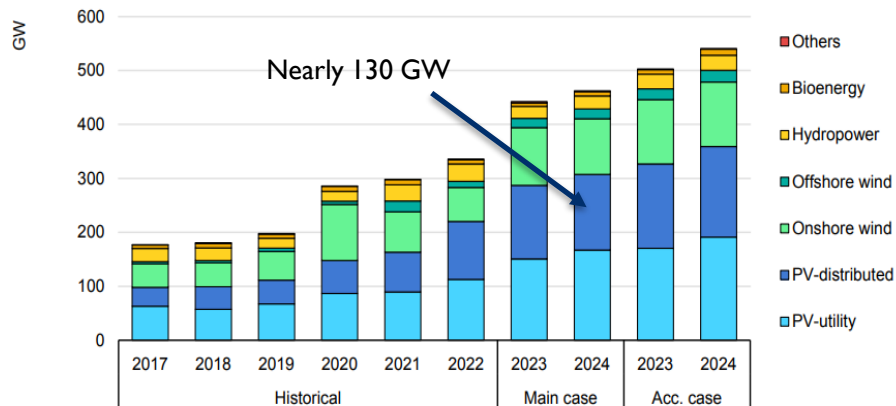


Global Scenario

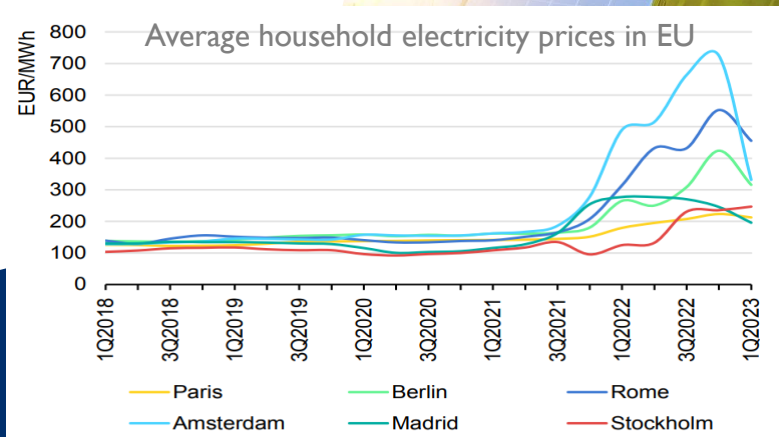
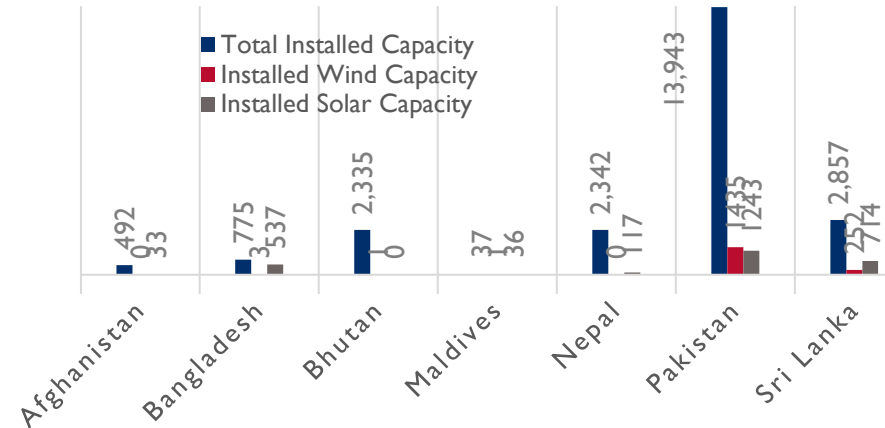
Global Energy Mix 2022



Ren 21- GSR-2023_Energy-Supply-Module.pdf
https://www.ren21.net/wp-content/uploads/2019/05/GSR-2023_Energy-Supply-Module.pdf



Capacity Installed In MW (2022)



IEA RE Market Outlook for 2023 and 2024

- Annual solar PV market growth is expected to continue, reaching almost **310 GW in 2024**, an increase of over 7% from 2023.
- Solar PV remains the main source of global renewable capacity expansion in 2023, accounting for **65% of growth with distributed applications**, including residential and commercial systems, accounting for almost half of global PV expansion.
- In the European Union, **residential and commercial solar PV systems account for 74% of the increase**, with the majority (82%) of the rise coming from six key markets: Germany, Spain, the Netherlands, France, Italy and Sweden.
- Policy makers in Europe, seeking options for immediate diversification away from imported fossil fuels, have initiated **improving the policy environment for distributed solar PV systems** that can be installed rapidly.



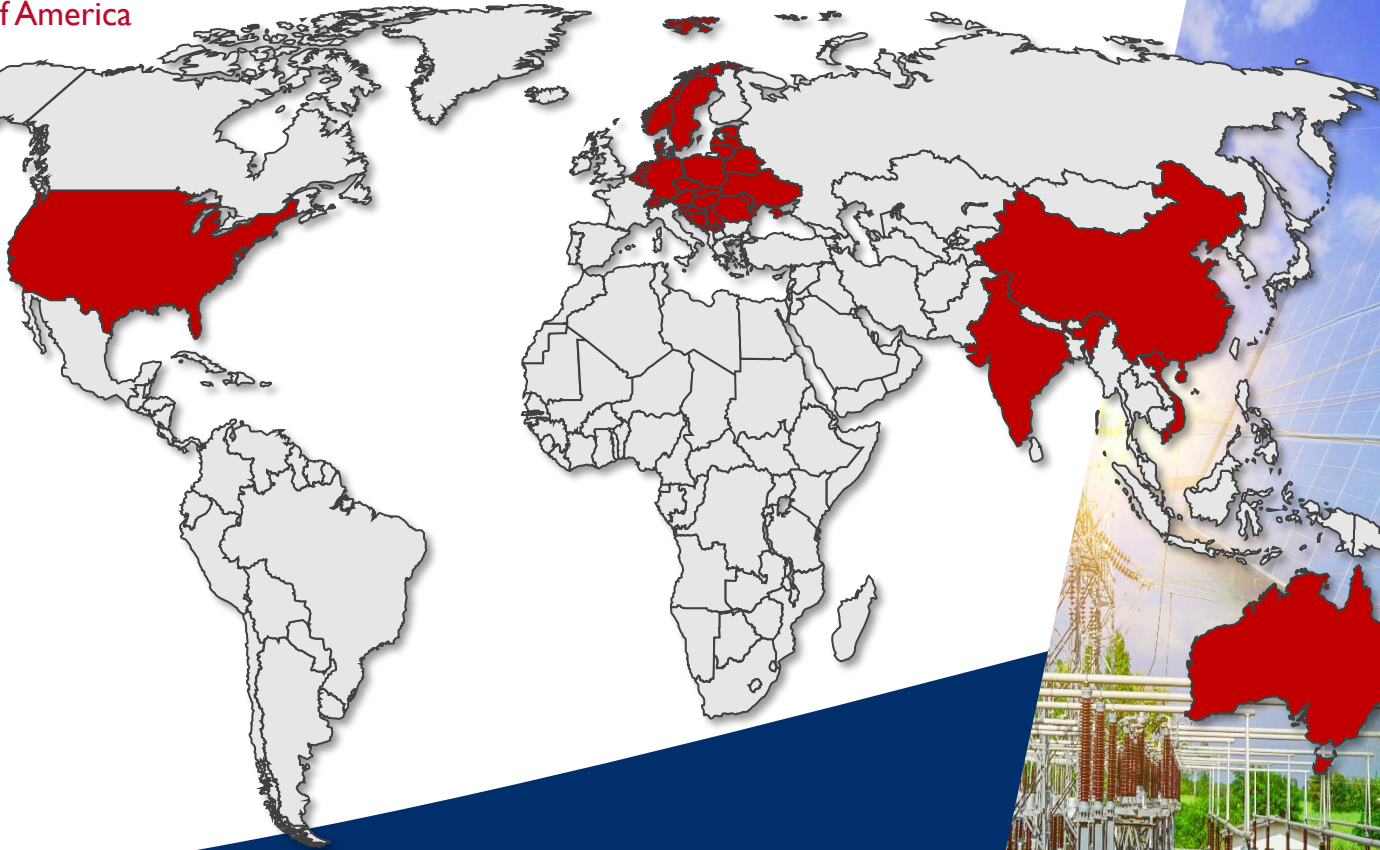


Overview of Programs, Schemes, and Targets

Country-wise

Countries Covered

- United States of America
- Europe
- China
- Australia
- India
- Vietnam



Topics Covered:

- National Targets
- Programs
- Schemes



USA

Target!

- Achieve a carbon-free electricity sector by 2035;
- Equitably transition America to net-zero greenhouse gas emissions economy-wide by no later than 2050

National Level Programs

- Federal Solar Tax Credits for Businesses² - can earn solar owners 30% of the cost to install solar panels back on their income taxes in the year after installation
- Financial incentives and programs: such as \$50M for commercial-scale distributed energy systems demonstration³ such as Washington State Renewable Energy System Incentive Program
- Community Renewables
- Third Party Ownership – solar leases or residential power purchase agreements

State Level Programs

- Performance-based incentives - incentives are typically paid directly to the solar owner on their electricity bill as a “bonus” amount for every kWh of electricity produced by their solar panels
- Net Metering - produce onsite electricity and sell excess generation to the utility at a set price⁴

1. https://www.renewable-ei.org/pdf/download/activities/01_Key_AlejandroMoreno.pdf

2. <https://www.energy.gov/eere/solar/federal-solar-tax-credits-businesses>

3. <https://www.energy.gov/oeed/articles/new-funding-opportunity-50m-commercial-scale-distributed-energy-systems-demonstration>

4. <https://www.energy.gov/scep/slsc/renewable-energy-distributed-generation-policies-and-programs>



EUROPE

Target¹-

- To achieve 45% of RE by 2030

Solar²

- European Rooftop Solar Initiative - a legally binding EU solar rooftop obligation for certain categories of buildings
- Initiative sets the objective of adding nearly 50 GW by 2025
- French aid scheme, which is projected to support the rooftop solar development of 3.7 GW. EC has allocated a budget of USD 6.8 billion
- Berlin Solar Act which requires the installation of solar photovoltaic systems on all new buildings in Berlin from 2023
- Norway solar-rebate program offers 108 Euro per kW rebate on installed for a maximum of 15 kW

Wind³

- Community Wind power
- Mandatory Buy-back (feed-in-tariff)
- Capital subsidies

1. Source: <https://www.mordorintelligence.com/industry-reports/europe-distributed-power-generation-market>
2. <https://www.iea.org/policies/15691-repowerEU-plan-joint-european-action-on-renewable-energy-and-energy-efficiency>
3. <https://exchange.world/goal-7-11.html>

China

Target!

- Targets 3,300 TWh of renewables electricity generation by 2025.
- Over 50% of electricity consumption growth by 2025 met by renewables.

- Urban rooftop photovoltaic action: Focus on promoting the use of rooftops of government buildings, transportation hubs, schools, hospitals, industrial parks and other buildings
- Photovoltaic+ - comprehensive utilization action: Promote the development of photovoltaic power generation such as agricultural and fishery sectors
- Townships and Villages: Promote the construction of rural wind power in counties as a unit
- Operation Muguang program for Households: Village collective centralized sites to carry out distributed photovoltaic construction
- New energy power station upgrade and transformation action: promote the decommissioning and renovation of wind power and PV power generation equipment



Australia

Target¹-

- Achieve 82% renewable electricity by 2030

- Home and business battery scheme – Offers a grant of \$400 per kilowatt-hour, up to a maximum grant of \$5,000 on eligible battery systems.
- Subsidy of 50% for small scale rooftop solar, up to 2500\$ for low-income houses
- Battery Booster Rebate - a rebate of up to \$3,000 on home batteries to households with a combined income of under \$180,000.
- Financial incentives in the form of Small-scale Technology Certificates (STC) for installing solar panels - With each STC worth nearly \$40 AUD. These rebates bring the cost per watt from \$1.56 to \$ 1.12
- Sustainable Household Scheme - This scheme provides zero-interest loans to help with the costs of energy-efficient upgrades
- Rebates - The Australian government provides up to \$8,000 for installing the solar system in houses and community-use buildings

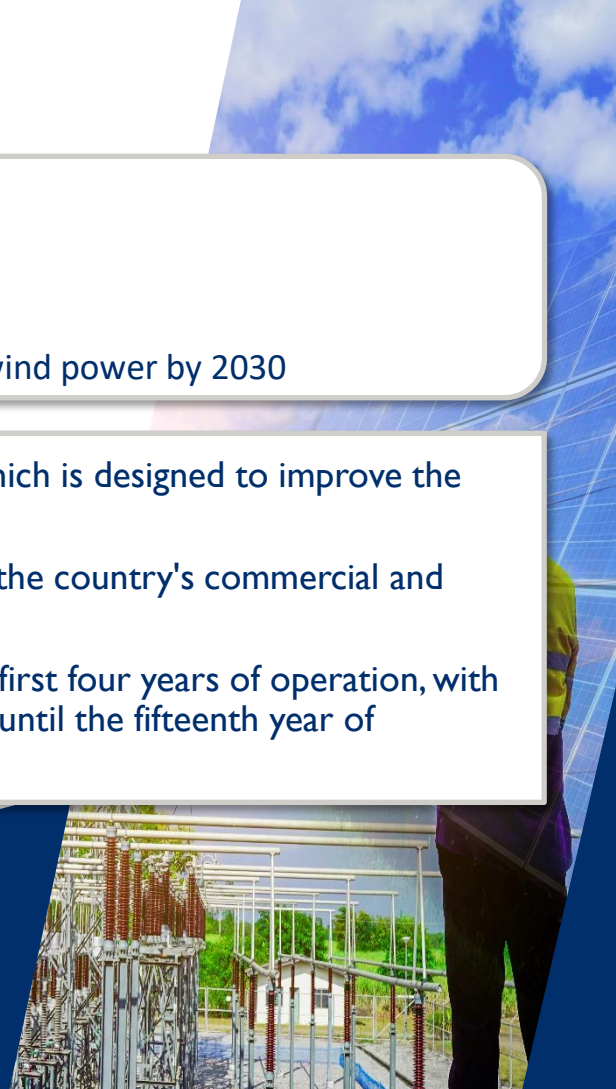


Vietnam

Target¹-

- Net Zero by 2050
 - 75% of generation capacity from renewables by 2050
 - 3.4 GW of Solar by 2045²
 - 21,000 MW of onshore and near-shore wind power, 7,000 MW of offshore wind power by 2030
-
- Released its National Power Development Plan VIII for the 2021-30 period, which is designed to improve the country's energy security²
 - Plans to create conditions for deploying rooftop PV systems in at least half of the country's commercial and residential buildings through net metering²
 - Exemption of solar (and wind) generators from corporate income tax for the first four years of operation, with a 50 percent reduction for the following nine years and then a 10 percent cut until the fifteenth year of operation.

1. <https://www.pwc.com/vn/en/publications/2023/230803-pdp8-insights.pdf>
2. <https://www.pv-magazine.com/2023/05/16/vietnams-solar-development-moves-to-rooftops-net-metering/>
3. <https://www.trade.gov/country-commercial-guides/vietnam-power-generation-transmission-and-distribution>



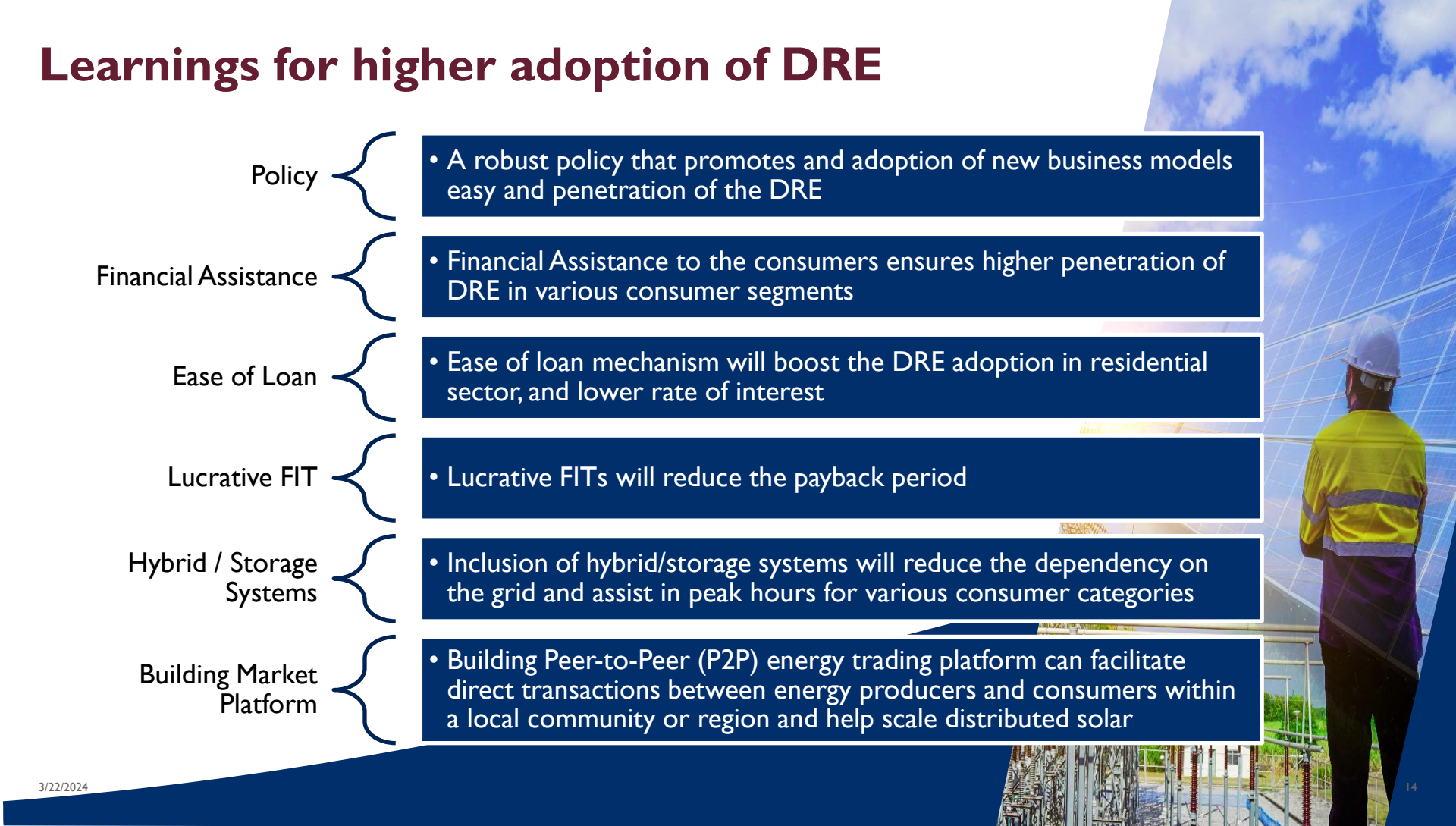
India

Target-

- Installed capacity of 40 GW Rooftop Solar plants by 2030
-
- Grid Connected Rooftop Solar and Small Power Plant Programme
 - CPSU Scheme Phase-II (Government Producer Scheme)
 - PM Surya Ghar Muft Bijli Yojna – 10million households RTS deployment program
 - Multiple Metering Mechanisms such as Net Metering, Gross Metering, Virtual Net metering, Group Net Metering etc.
 - Central Financial Assistance to up to 3 kW
 - PM KUSUM - Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan Scheme



Learnings for higher adoption of DRE

- 
- Policy
 - A robust policy that promotes and adoption of new business models easy and penetration of the DRE
 - Financial Assistance
 - Financial Assistance to the consumers ensures higher penetration of DRE in various consumer segments
 - Ease of Loan
 - Ease of loan mechanism will boost the DRE adoption in residential sector, and lower rate of interest
 - Lucrative FIT
 - Lucrative FITs will reduce the payback period
 - Hybrid / Storage Systems
 - Inclusion of hybrid/storage systems will reduce the dependency on the grid and assist in peak hours for various consumer categories
 - Building Market Platform
 - Building Peer-to-Peer (P2P) energy trading platform can facilitate direct transactions between energy producers and consumers within a local community or region and help scale distributed solar

- *Stable 24-hour power production capability*
- *Modular design; scalable system*
- *Mechanical braking at high-speed winds*
- *Appropriate for on or off grid applications*
- *Online tool for power generation monitoring*
- *Power generation starting at 2 m/s wind speed*
- *Easy assembly and maintenance*



Roof-Top Wind & Solar Hybrid Energy System

Thank You



P2P linking of DRE through DSO with mainstream

Integrating small-scale renewable energy producers and consumers into the larger electricity grid while facilitating direct transactions through P2P trading

- **Market Platforms:** P2P energy trading platform facilitate direct transactions between energy producers and consumers within a local community or region. These platforms use digital technologies, such as blockchain or smart contracts, to enable secure and transparent energy trading without the need for intermediaries.
- **Flexibility and Optimization:** P2P linking of DRE with the mainstream grid enables greater flexibility and optimization of energy resources by leveraging local generation and consumption patterns. Participants can buy or sell excess energy based on their needs and preferences, promoting efficient use of renewable energy and reducing reliance on fossil fuels.

