

Energy transition

EREA/MOIT

Legal framework

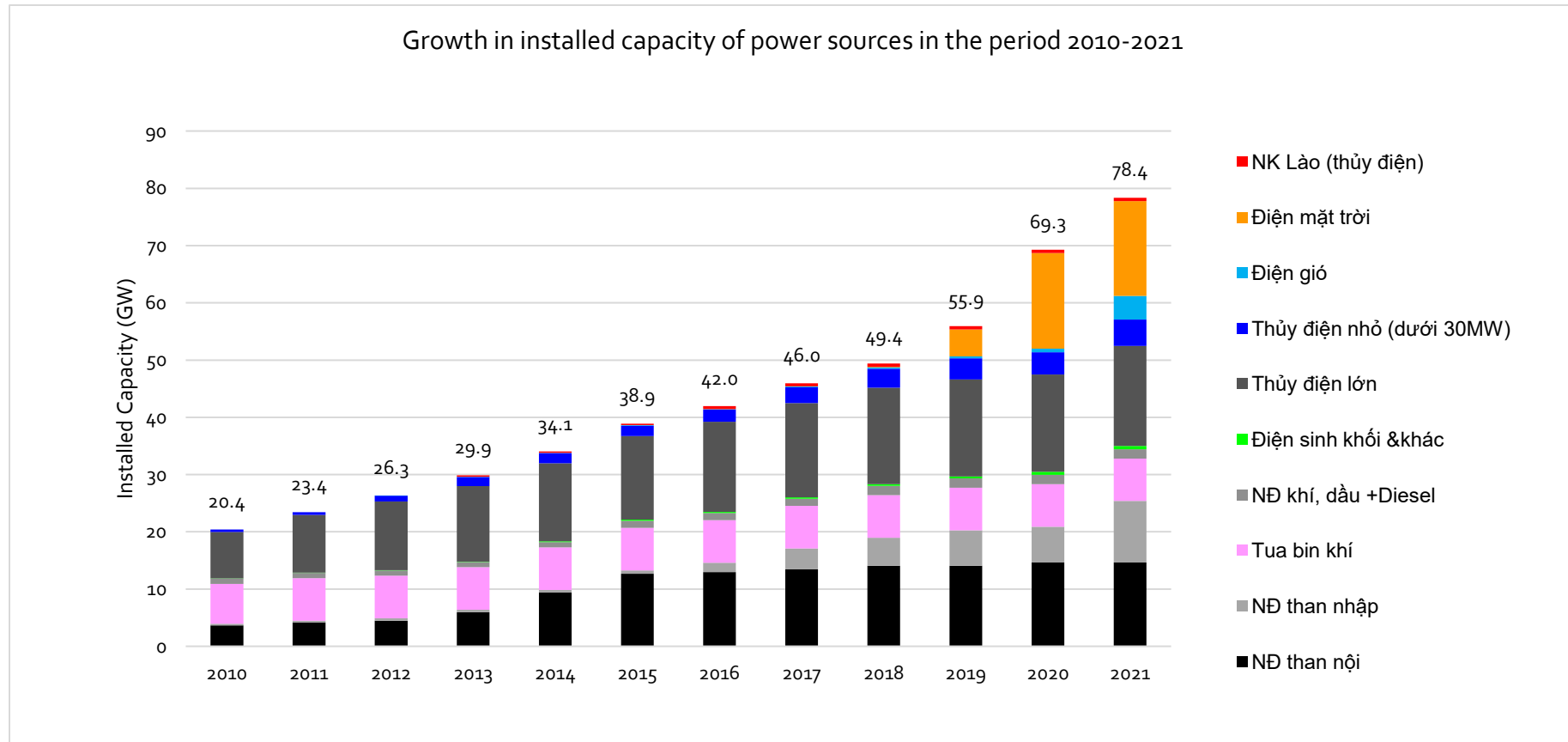
- **Decision 2068/QD-TTg** issued in Nov. 2015 by the PM on National strategy on Renewable energy to 2030, with vision to 2050
- **Resolution 55-NQ/TW** issued in Feb. 2020 by Politburo on Orientation of the national energy development strategy to 2030 with a vision to 2045
- **Decision 1658/QD-TTg** issued in Oct. 2021 by the PM on National green growth strategy for the period of 2021-2030, with vision to 2050
 - Ensure national energy security
 - Energy is the foundation for economic development
 - Minimize environmental impact through RE and EE promotion
 - Reduce portion of coal-fired power plants
 - Strongly promote RE resources (Wind onshore and offshore, Solar, Biomass, Waste,....)

Target

Tarrget	2020	2025	2030	2045	2050
Development of RE					
Weight of renewable energy in primary energy supply (Resolution 55/NQ-TW)			15-20%	25-30%	
Energy saving compared to normal development scenario					
Level of energy saving in the final energy demand (VNEEP3)		5-7%	8-10%		
Reduce GHG emissions compared to the normal development scenario					
Resolution 55/NQ-TW			15%	20%	
Net zero commitment _ at COP26					Net emission = 0

ELECTRICITY SYSTEM _

- By 2021, total installed capacity of the power system was ~ 78.4 GW, the largest scale in ASEAN .
- Vietnam is one among 10 countries globally leading in investment in RE (wind power and solar power).



PDP8 & positions

- Ensuring energy security, providing enough electricity for socio-economic development at reasonable prices, improving autonomy, and diversifying the import sources.
- Synchronously develop power sources and grids to ensure transmission capacity on a basis of balancing between regions and areas
- Import electricity at appropriate scale from neighboring countries
- Reach “zero” emissions by 2050.
- No more development of new coal-fired thermal power plants after 2030, stop operating coal thermal power plants after 40 years of operation, gradually switch to using green biomass/ammonia from 2035. Stop completely coal thermal power plants after 2050.
- Develop LNG power source with appropriate scale, no new development after 2035 and gradually switch to using hydrogen fuel.

PDP8 & positions

- Promote the development of renewable energy (wind power, solar power, biomass power, etc.) with reasonable cost associated with ensuring operation safety and cost – efficiency of the power system.
- Developing pump storage hydro power, battery storage and researching other types of renewable energy such as geothermal, ocean waves, etc.
- Prioritize renewable energy sources for self consumption or export, no generation to the national grid; Renewable energy combined with production of electrolytic fuels such as hydrogen, green ammonia, etc.).
- Enhance the economical and efficient use of energy and ensure the goals of sustainable development and environmental protection

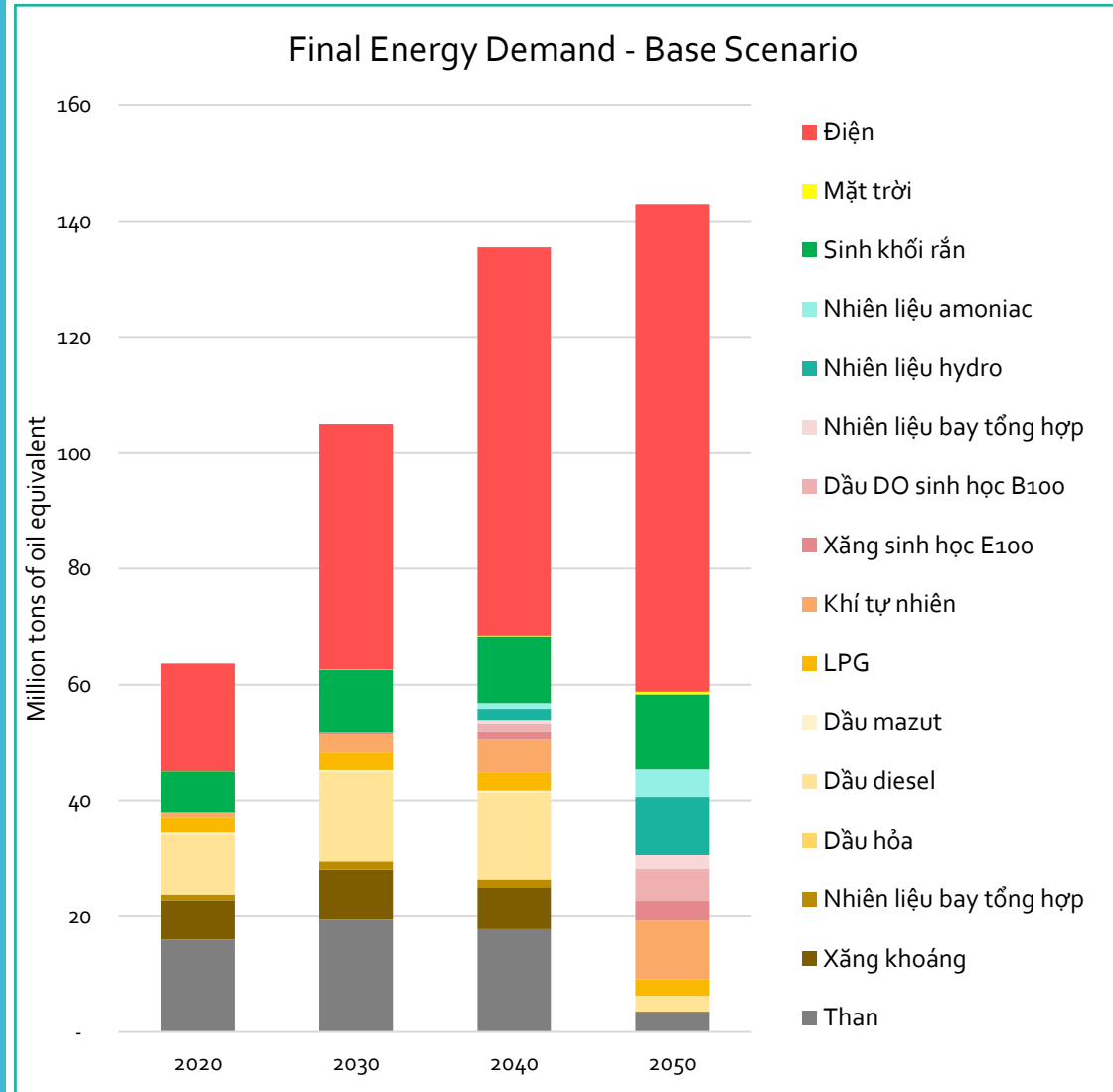
Proposed solutions

- Review, amendment and supplement of the legal documents, legal corridors, mechanisms and policies in order to:
 - Attract investment capital for development of power sources and grids, development of investment support mechanisms in combination with technology transfer and development of supply chains of materials and equipment.
 - Research to reduce administrative procedures to support investment and site clearance to meet the implementation progress of projects.
 - Stable operation of the power system with an increasing rate of renewable energy integration.

Proposed solutions (continued)

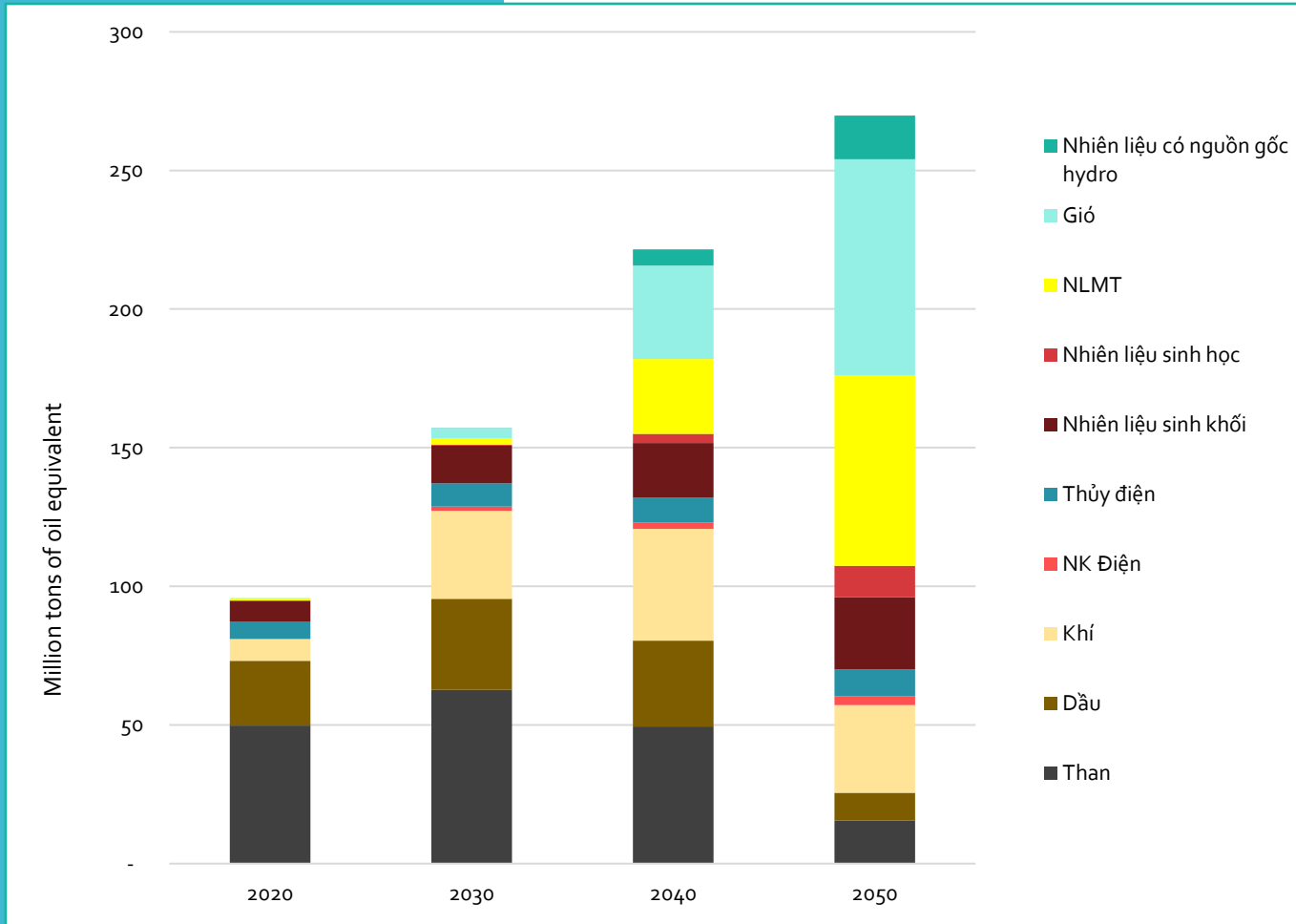
- Applying the achievements of Science and Technology Industry 4.0 in construction, operation management of energy systems/power systems
- Development and completion of a system of standards, regulations, regulations and guidelines to ensure the flexibility of new power plants, solutions to improve the flexibility of existing power plants.
- Enhancement of forecasting ability of renewable energy demand and power generation. Strengthening capacity of weather forecasting and capacity of renewable energy sources in various power system dispatching levels
- Training and attracting highly qualified human resources, ensuring to meet the requirements of modern technology application in the development and operation of modern energy systems
- Strengthen international cooperation in order to mobilize capital resources and develop technological autonomy capacity.

Final energy demand



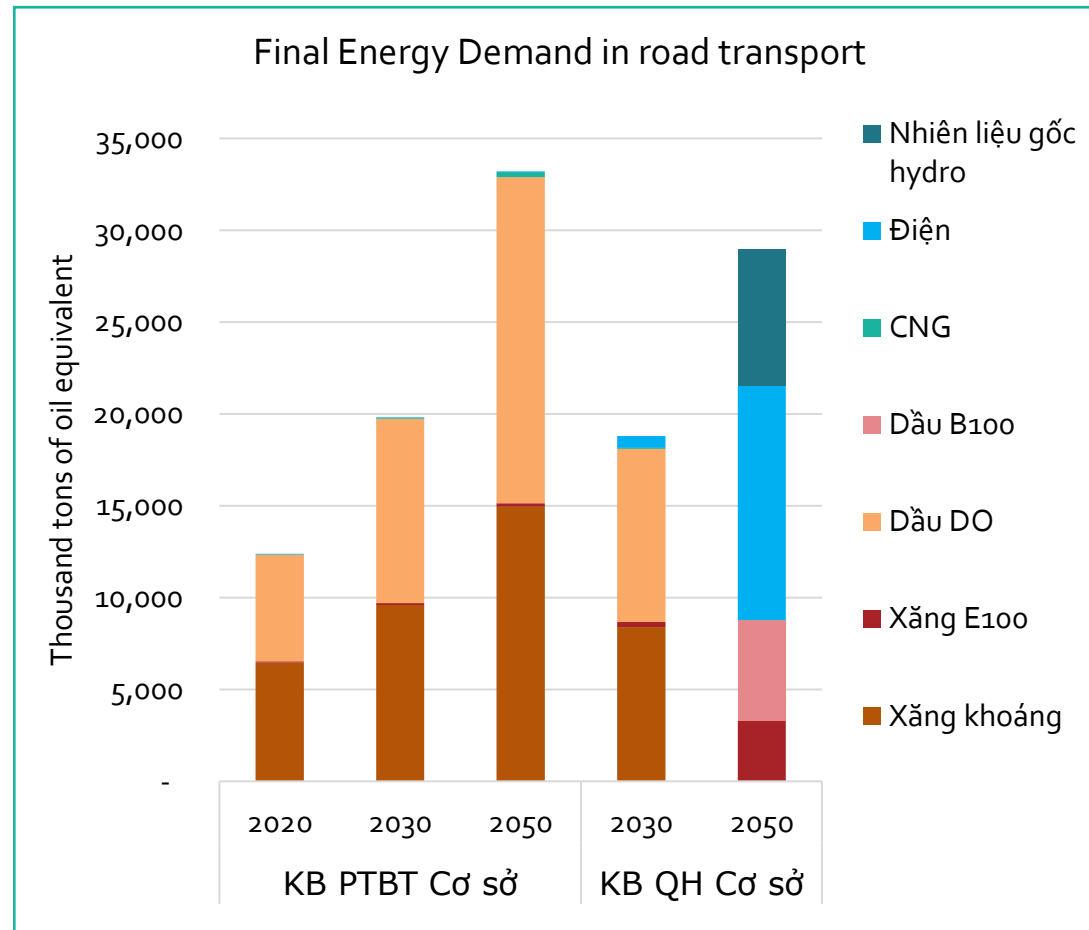
- **Energy demand:** reduce the rate of demand growth with high-EE equipment;
- **Energy structure:**
 - ✓ Transition to electricity
 - ✓ The Alternative fuels increase sharply after 2030 (hydrogen , ammonia , biofuels , e-fuels)

Primary energy demand



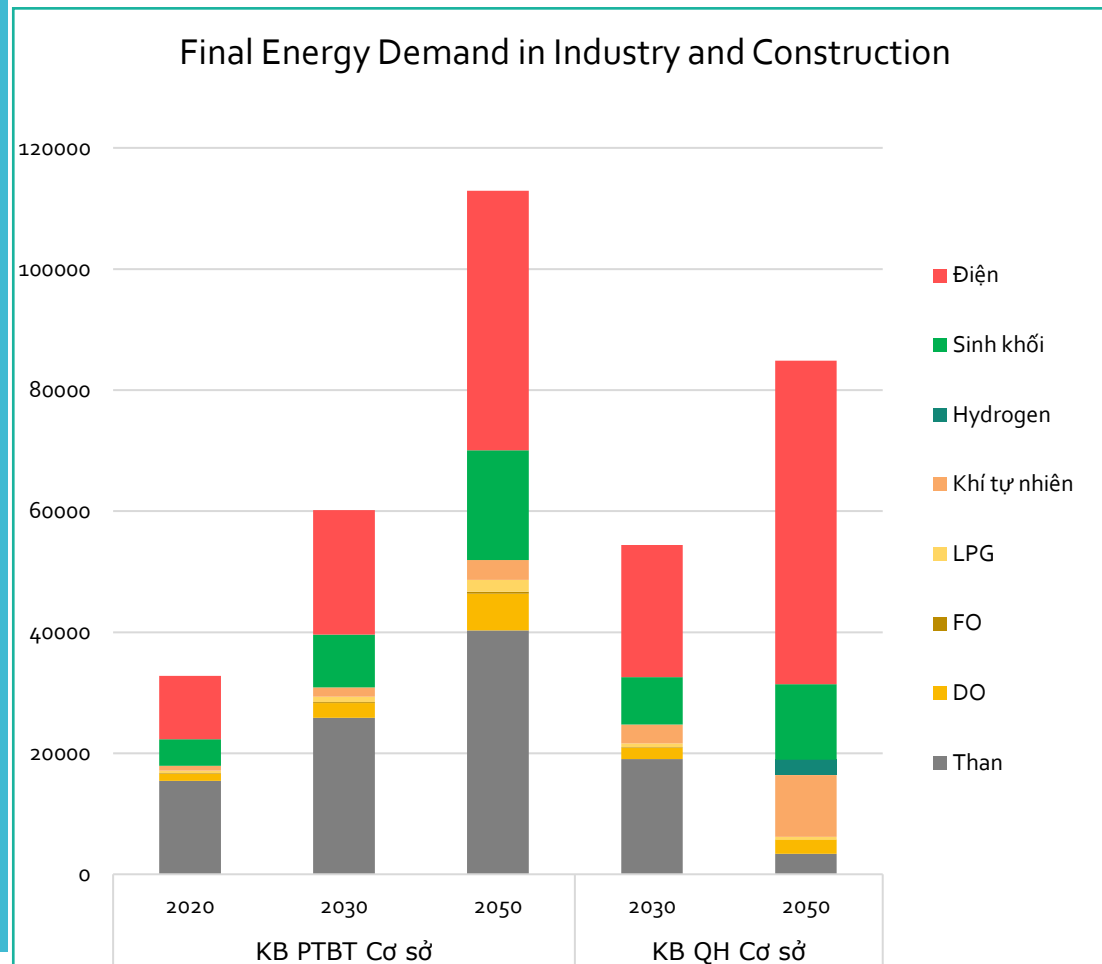
- **Energy demand:** increase by 4.9%/year 2021-2030 and 3.9%/year 2031-2050;
- **Energy structure :**
 - ✓ In 2020 coal 52%, oil 24% and natural gas 8%. Renewable energy accounts for about 16% with biomass 8%, hydropower 7% and solar and wind energy 1%.
 - ✓ By 2050, fossil energy will fall below 20% with natural gas 9%, oil 5%, coal 5%. Renewable energy increased >80% with wind 31%, solar 29%, hydrogen fuel 7%, biofuel 10%.

Energy Transition - Road Transport



- Fuel economy regulations;
- Restricting/prohibiting the use of petrol engines;
- Modal shift
- Enhance public transport (MRT)

Energy transition in industry & construction



- Waste heat utilization (WHR);
- Cogeneration of thermal power (Cogeneration);
- High efficiency motor (EM), inverter (VSD),
- Compressor...

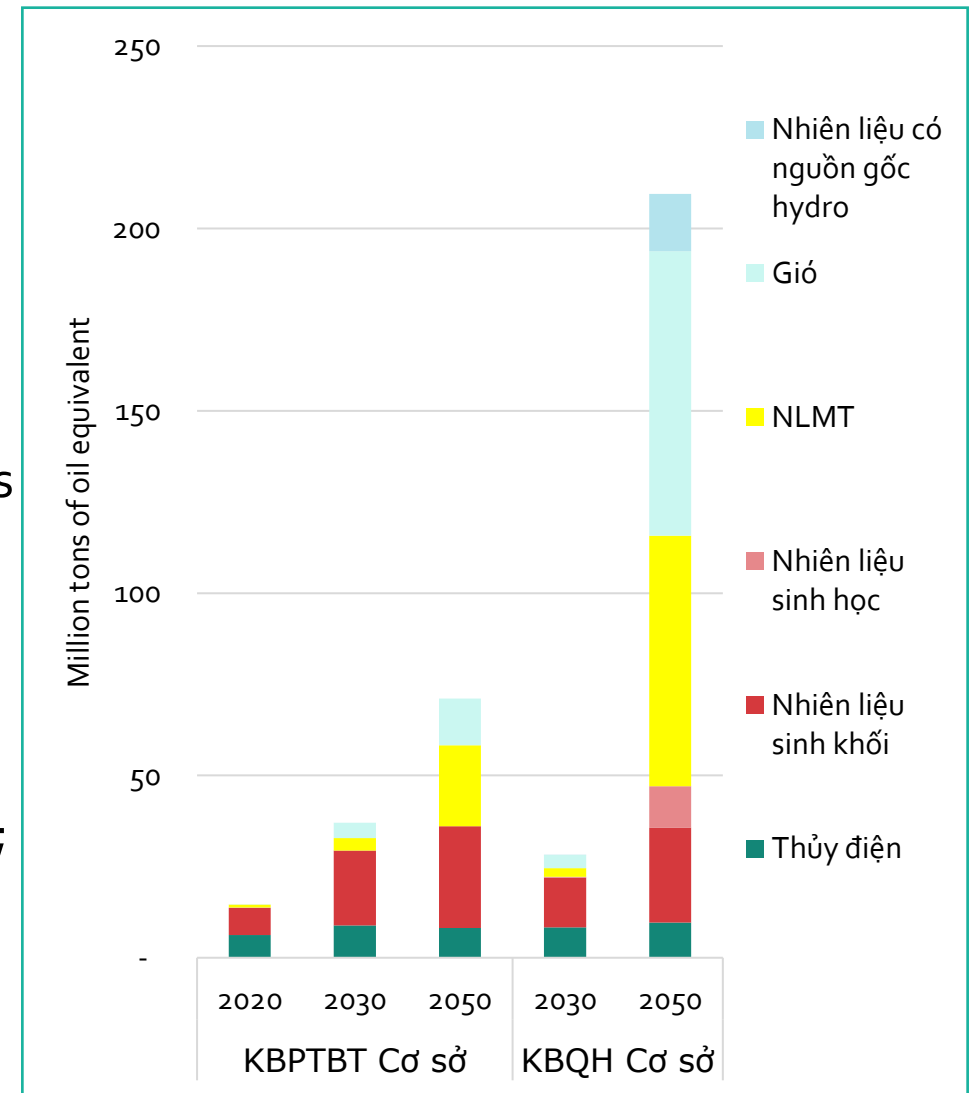
Energy transition - Renewable energy development

Renewable energy development:

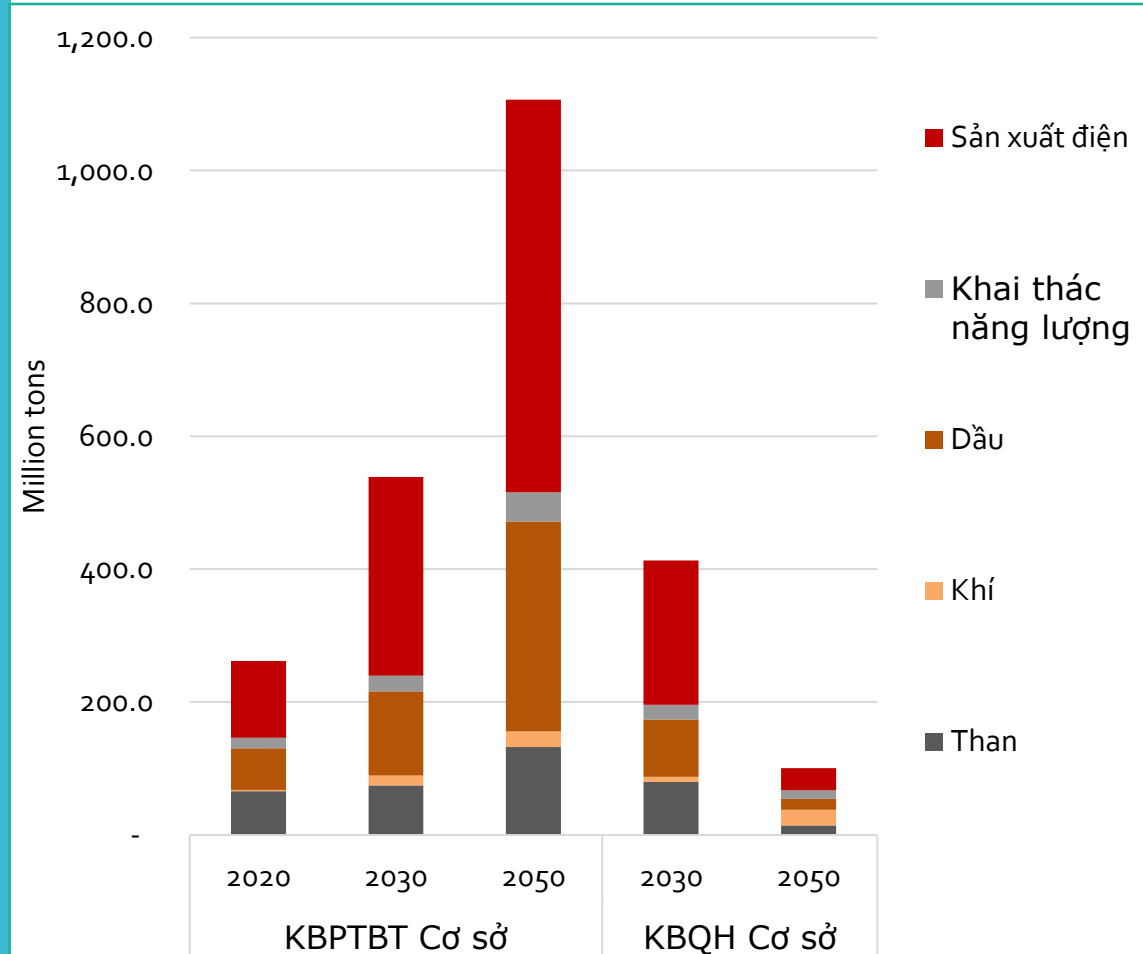
- focus on offshore wind power,
- rooftop solar power,
- floating solar,
- renewable energy power projects serving local electricity demand;

Production and use of biofuels:

- solid biomass fuels (power generation, co-generation of thermal power, heat production);
- advanced liquid biofuels (transportation).



Energy transition - Changing structure of CO₂ emissions



- Emission scale is reduced by more than 10 times compared to Normal Development Scenario
- Decarbonization through: renewable energy, alternative fuels in power plants, biofuels, hydrogen fuels;
- Areas difficult to decarbonization: heavy industry (cement, iron and steel, chemicals); Air and water transportation