



APEC Workshop on Small Hydro and Renewable Grid Integration

Ha Noi, Viet Nam

3-5 April 2013

Renewable Energy Electricity Generation Outlook in the APEC Region and Related Issues for Viet Nam

APEC Energy Demand and Supply Outlook 2013

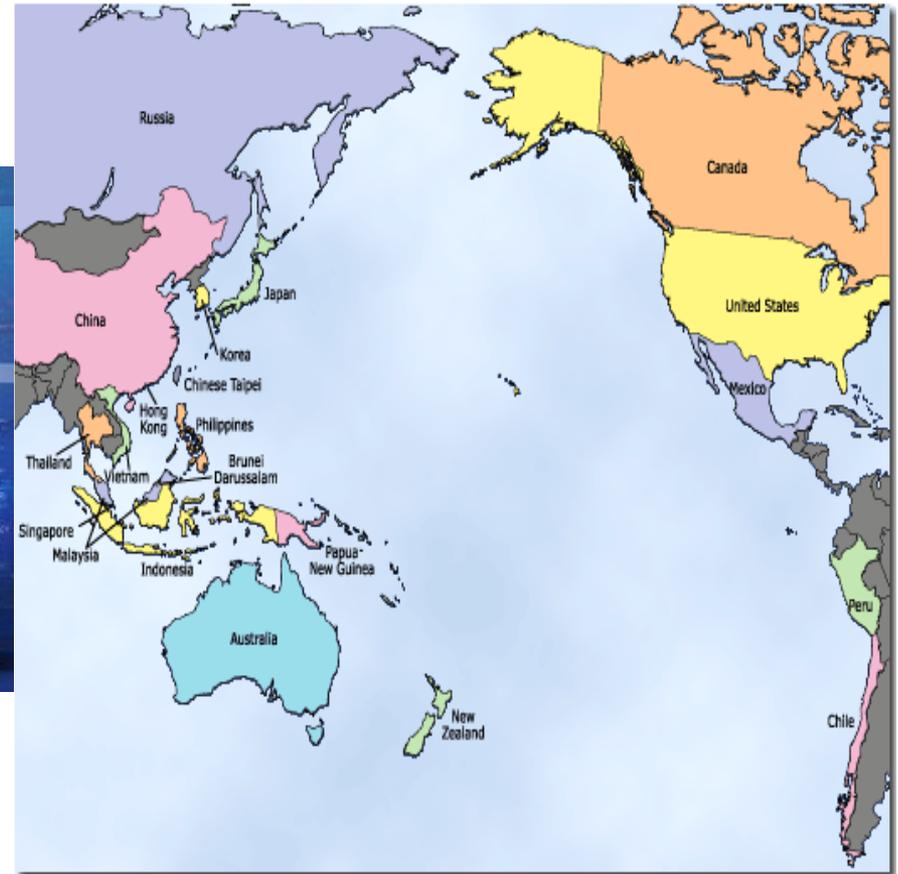
Tran Thanh Lien

Asia Pacific Energy Research Centre (APEREC)



Asia-Pacific
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APEC Energy Outlook 2013



APEC

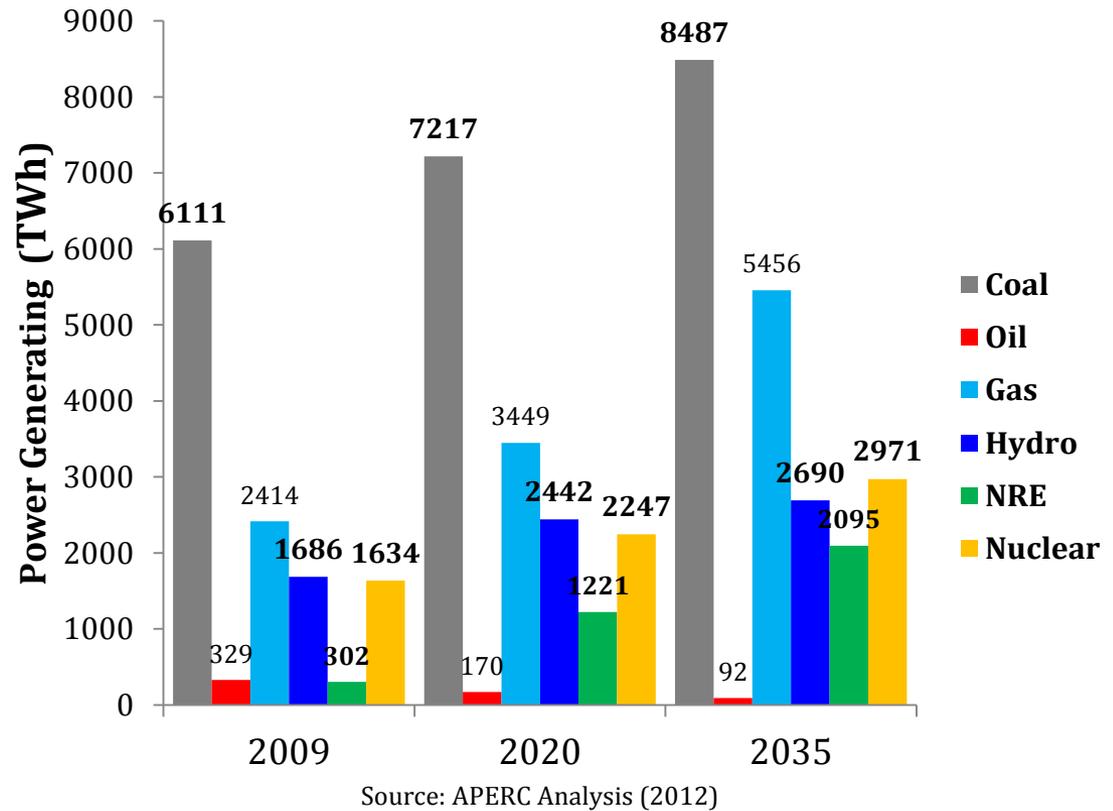
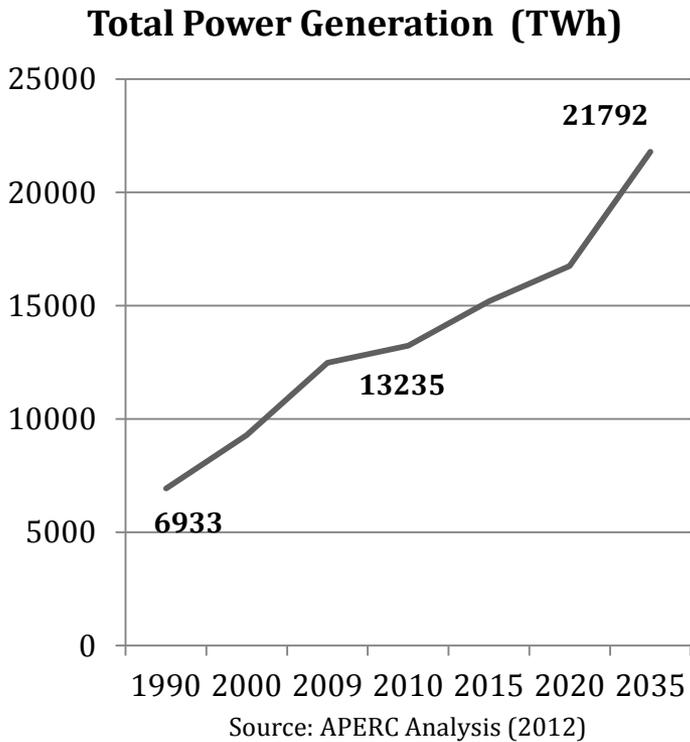
**Energy Demand and
Supply Outlook
5th Edition**

February 2013



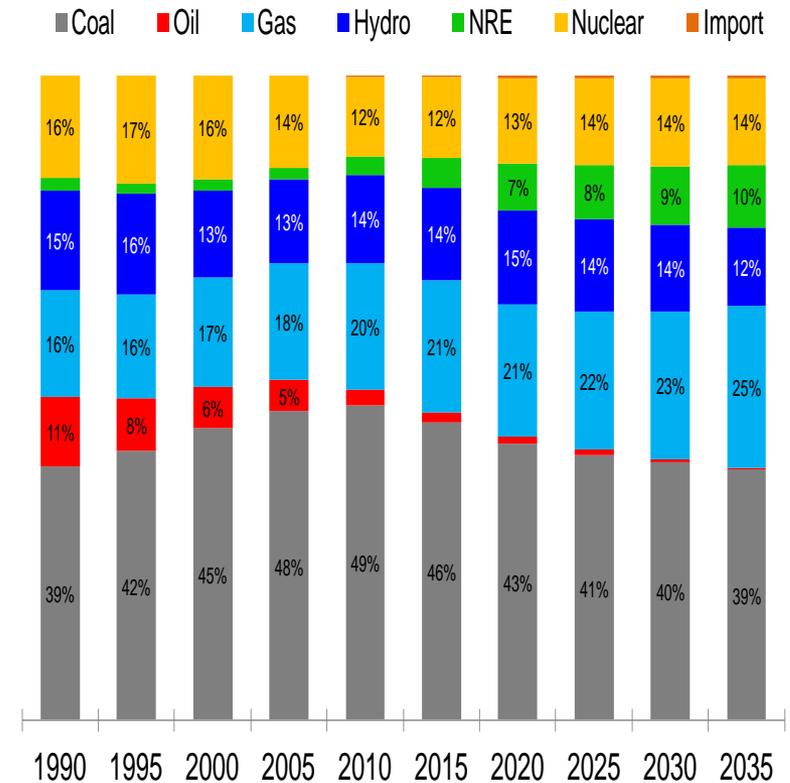
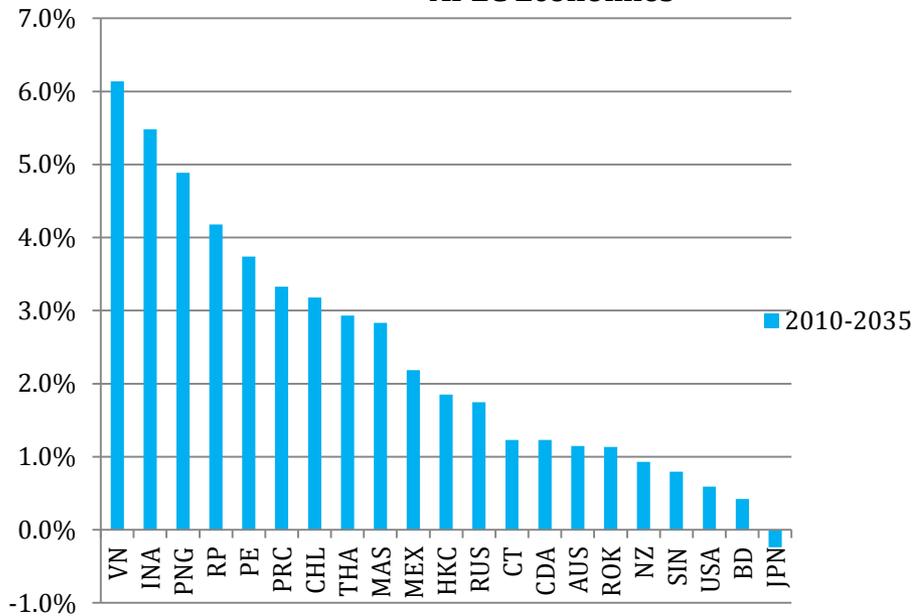
- APERC has historically produced an *APEC Energy Demand and Supply Outlook* every 2 or 3 years
- The 5th Edition was published in February 2013

Projected Electricity Generation by Source

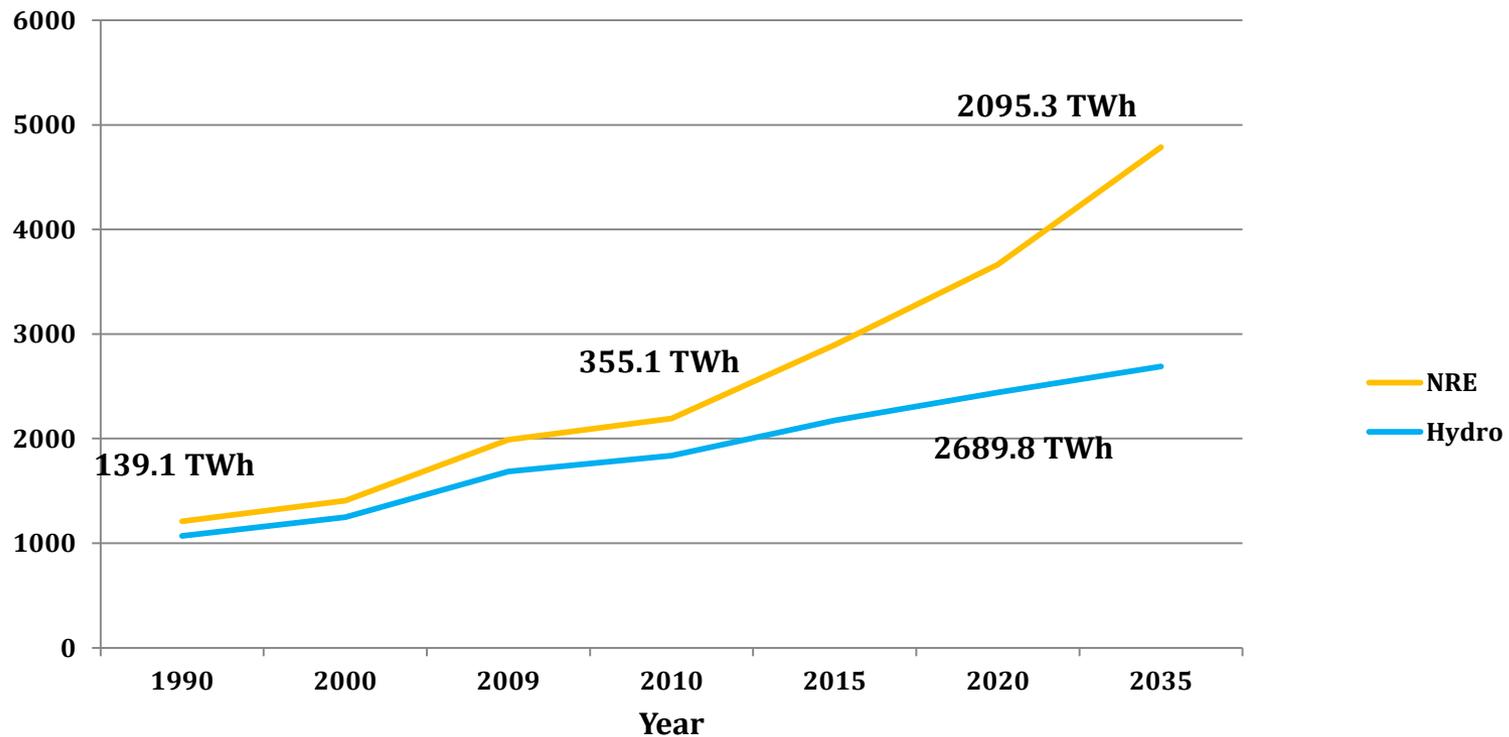


APEC Region Electricity Generation Mix (1990-2035)

Annual Growth Rates of Electricity Generation in APEC Economies



Key Finding: Strong Growth in Renewable Power but Modest in Hydro



Key Drivers for the strong NRE growth

- Supportive government policy
- Advancements of RE technology

Key Drive: APEC Renewable Energy Policy Support is Robust

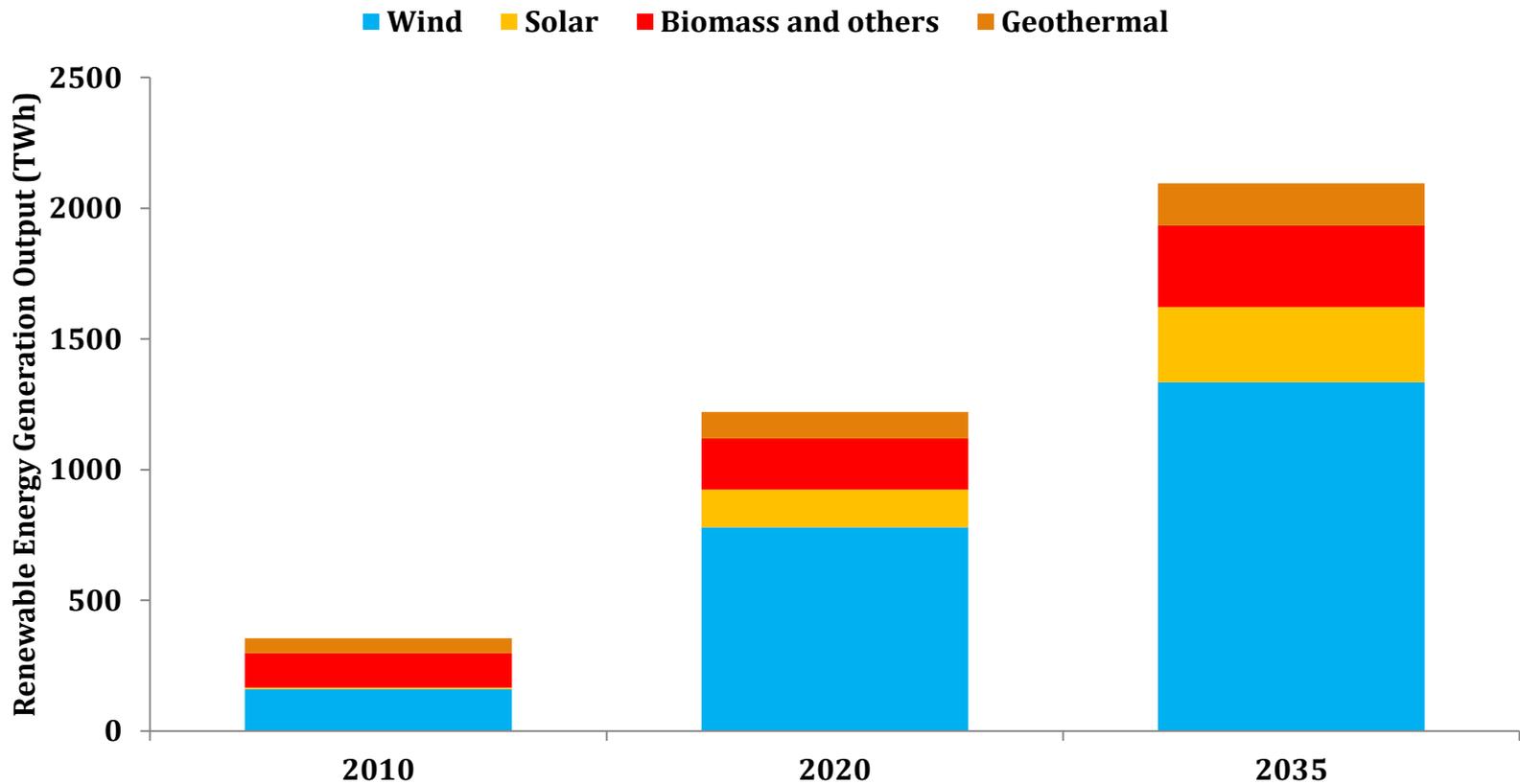
1. **Feed-in-tariffs** – utilities required to buy electricity from renewables at a guaranteed price
2. **Renewable portfolio standards** – Requirement of utilities to obtain a minimum fraction of their electricity from renewable sources
3. **Carbon pricing** – Tax on CO₂ emissions, which discourages the use of fossil fuels
4. **Regulations limiting greenhouse gas emissions** – Laws which limit the level of GHG emissions on certain fossil generation
5. **Phasing out fossil fuel subsidies for power generation** – As a strategy for several APEC developing economies



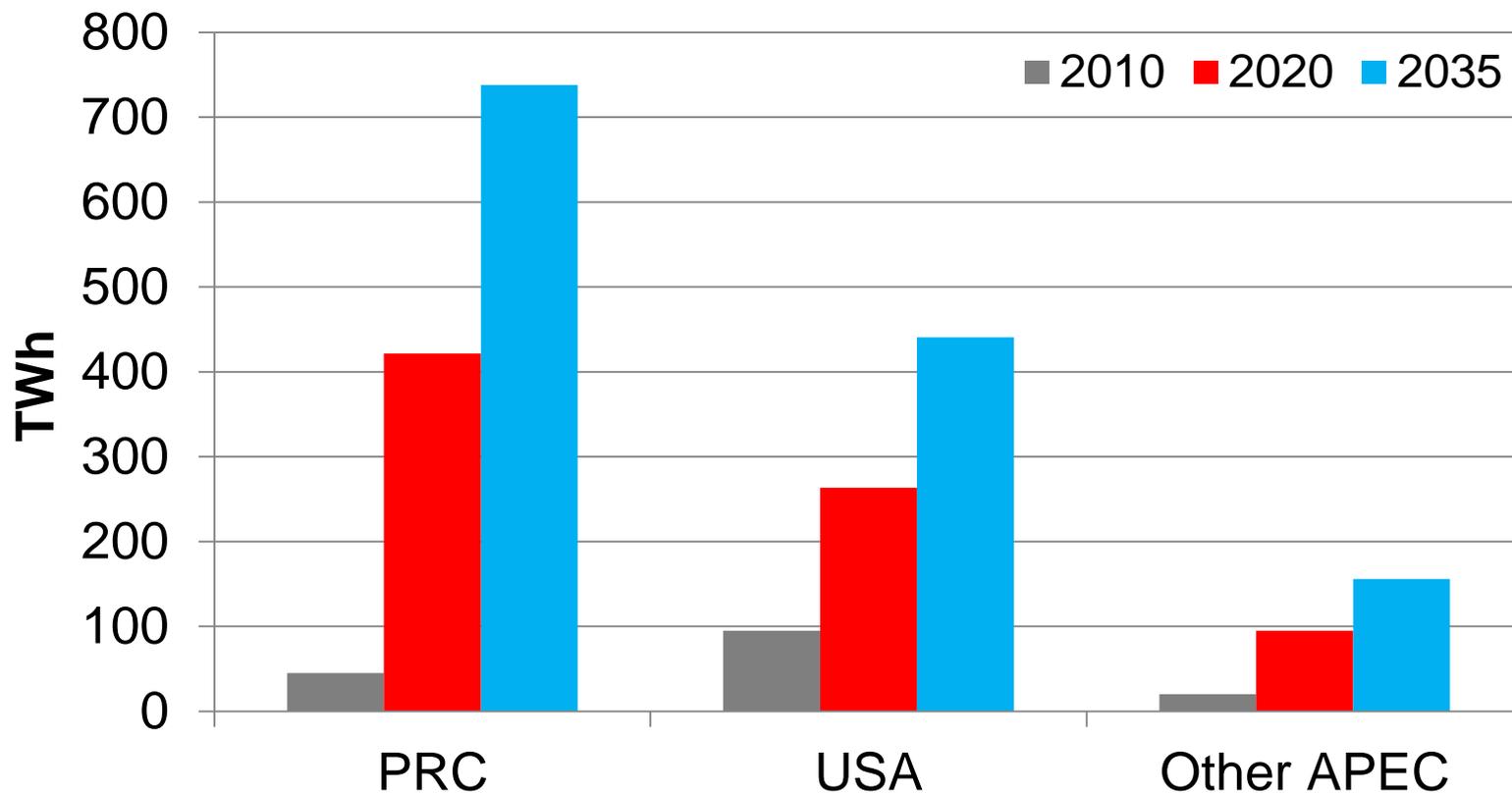
Key Drive: Rapid Declining RE technology costs

- Trend of module production costs for Solar PV declined sharply. USD 4.5/W in 2000 to USD1.00 /W in 2012 (LBNL) event less USD1.00/W
- Wind turbine prices had *doubled* during 2002 - 2008 then have fallen ~20%-30% in recent years and continues down for the long-term (LBNL)

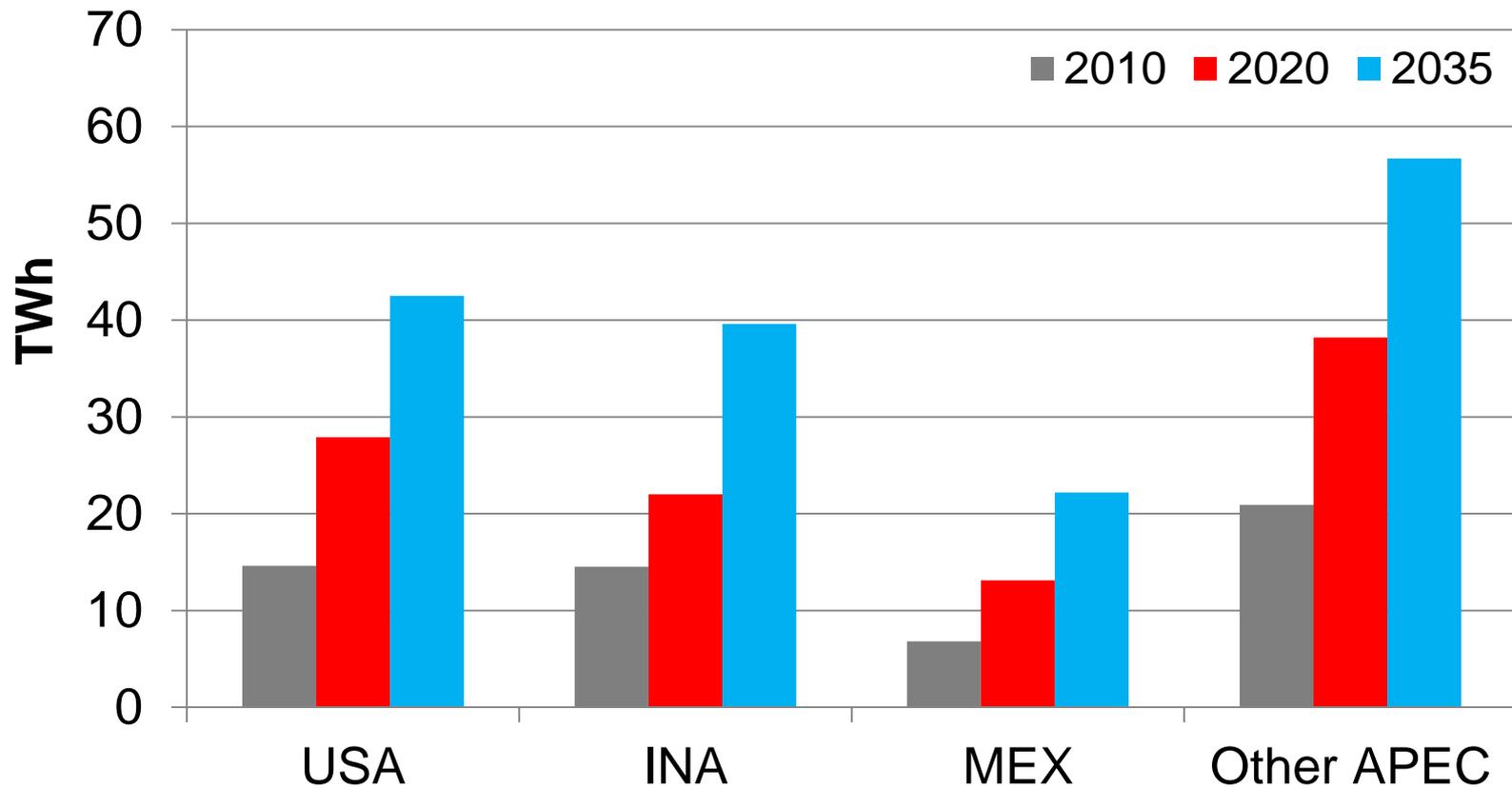
Key finding: Significant wind power addition expected in APEC Region



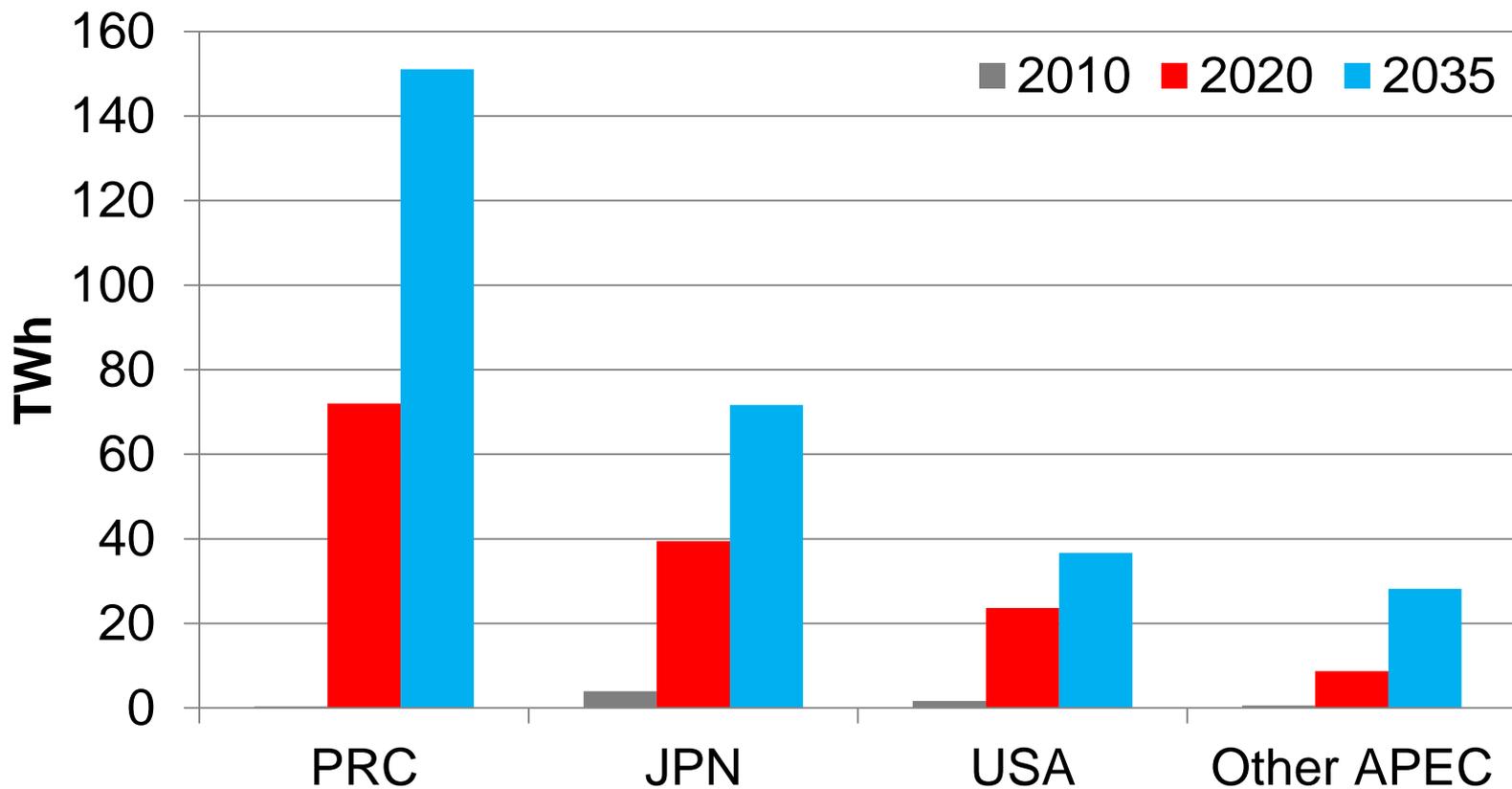
Wind power Generation by Economies



Geothermal-based Generation by Economies



Solar- Based Generation by Economies



The background features a collage of images including a train, a globe, a modern building facade, a stylized white cloud, and a busy street scene with cars. A semi-transparent blue horizontal bar is overlaid across the middle of the collage, containing the title text.

Related Issues for Viet Nam (1)

□ Opportunities

1. High growing electricity demand

2. Supportive policies

- Diversification of power generation based on energy security
- Clear target on RE electricity: 4.5% by 2020 and 6% by 2030 (PDP7)
- A number of Decrees and Decisions approved by the Prime Minister to offer incentives to RE projects in recent years

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Related Issues for Viet Nam (2)

4. Viet Nam has experience on the development of small hydropower plants in the past

5. Global aspect

- Trend of reduction in RE technology costs for wind and PV in the world and the APEC region
- APEC RE market stronger than expected: increasing over 6 folds from 139 GW to 816 GW between 2010-2035 (APEC outlook 2013)

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Related Issues for Viet Nam (3)

□ Challenges

1. Institutions issue

- Electricity Pricing Framework: FIT is just in the initial stage; low electricity price
- Inadequate policy support in planning, financing, legal framework.

2 Technical issue

- Lack of infrastructures
- Lack of RE database system including RE potential maps (for wind, solar, biomass)

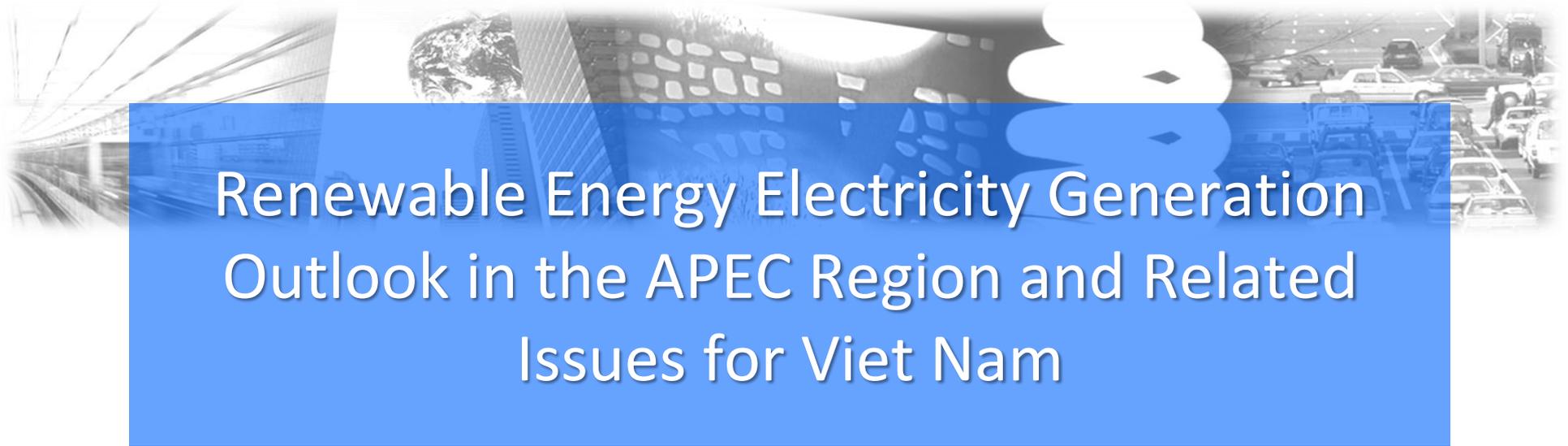
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Related Issues for Viet Nam (4)

- Distribution network is weak, doesn't meet the higher amount of RE electricity introduced to the grid
- Insufficient amount of operating reserves due to the RE resources are intermittent

3. None technical issue

- Still much high capital costs of NRE compared to fossil fuel fired power plants in VN
- Shortage of human resources especially technical expertise on NRE field
- Lack of studies on assessment of impact on the grid taking into account the RE resources

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Thank you for your kind attention

Tran Thanh Lien, Ph.D

Team leader, APERC

tran@aperc.ieej.or.jp

<http://www.ieej.or.jp/aperc>