



APEC Demand and Supply Outlook 5th Edition A Preliminary APERC View

5 March, 2012

APERC Workshop, Kuala Lumpur

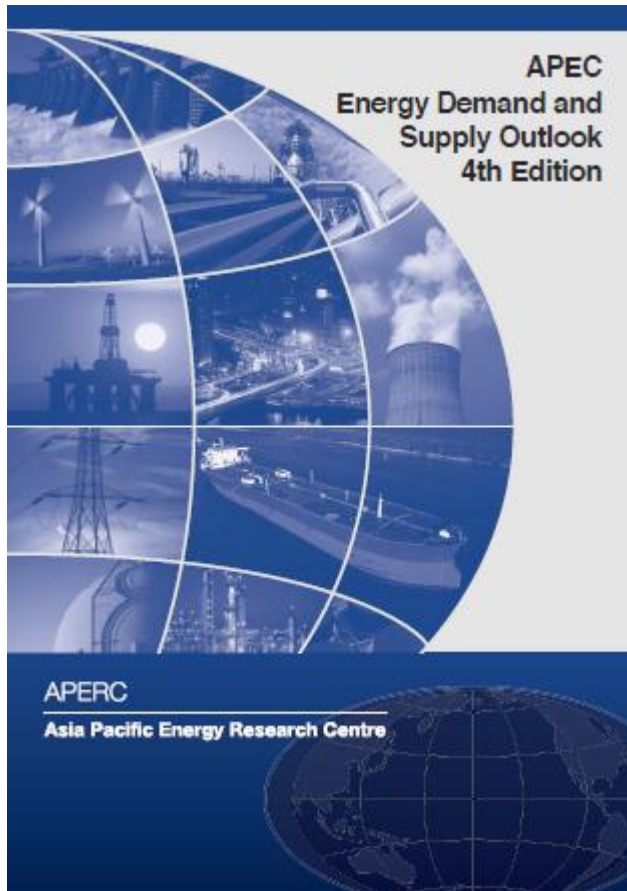
Ralph D. Samuelson
Vice President
Asia Pacific Energy Research Centre



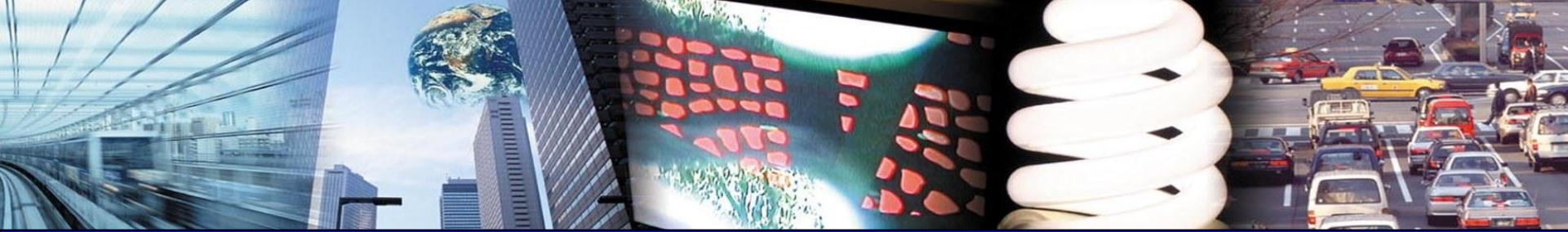
Asia-Pacific
Economic Cooperation



APEC Energy Outlook



- In 2009, APERC published the *APEC Energy Demand and Supply Outlook 4th Edition*
- Work now underway on the 5th edition, to be published in late 2012



Outlook 5th Edition Description

- A 25 year look ahead (2010-2035) assuming business-as-usual and several alternative cases
- Project energy supply by fuel and demand by sector, electricity generation by fuel; installed generation capacity, CO₂ emissions, energy intensity
- Published in two volumes:
 - Volume 1: Mainly sector discussions
 - Volume 2: Mainly individual economy discussions
- Draws on expertise of APERC researchers as well as other expert advice



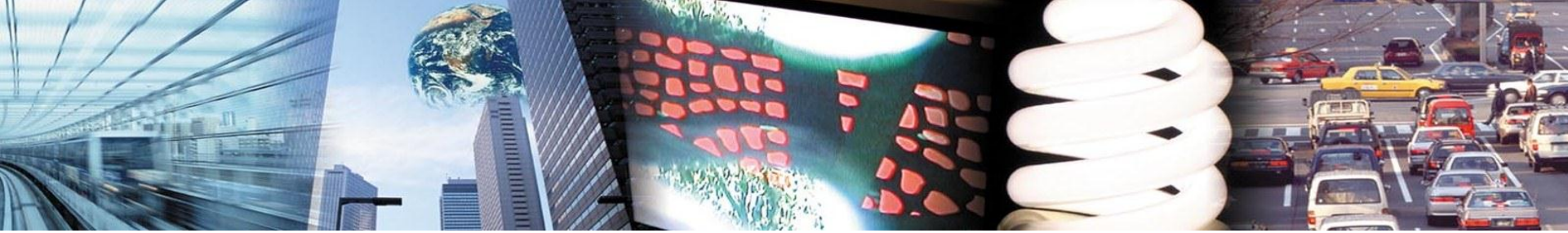
The Progress So Far

- Entirely new modelling software has been developed
- Preliminary business-as-usual projections have been estimated for all economies.
- A thorough internal review of the business-as-usual projections for each economy is now underway.
- Software to summarize and graph key results by economy, by region, and APEC-wide has been developed
- APERC researchers are currently writing the Volume 2 sections, which discuss the results for each economy.

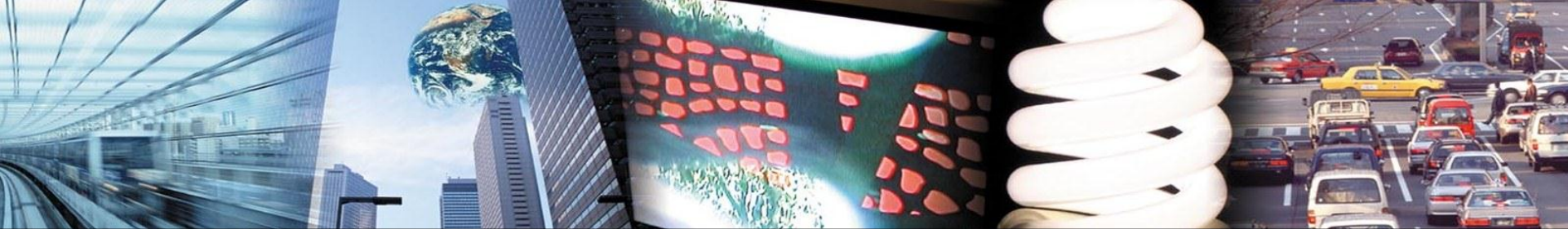


Remaining Tasks

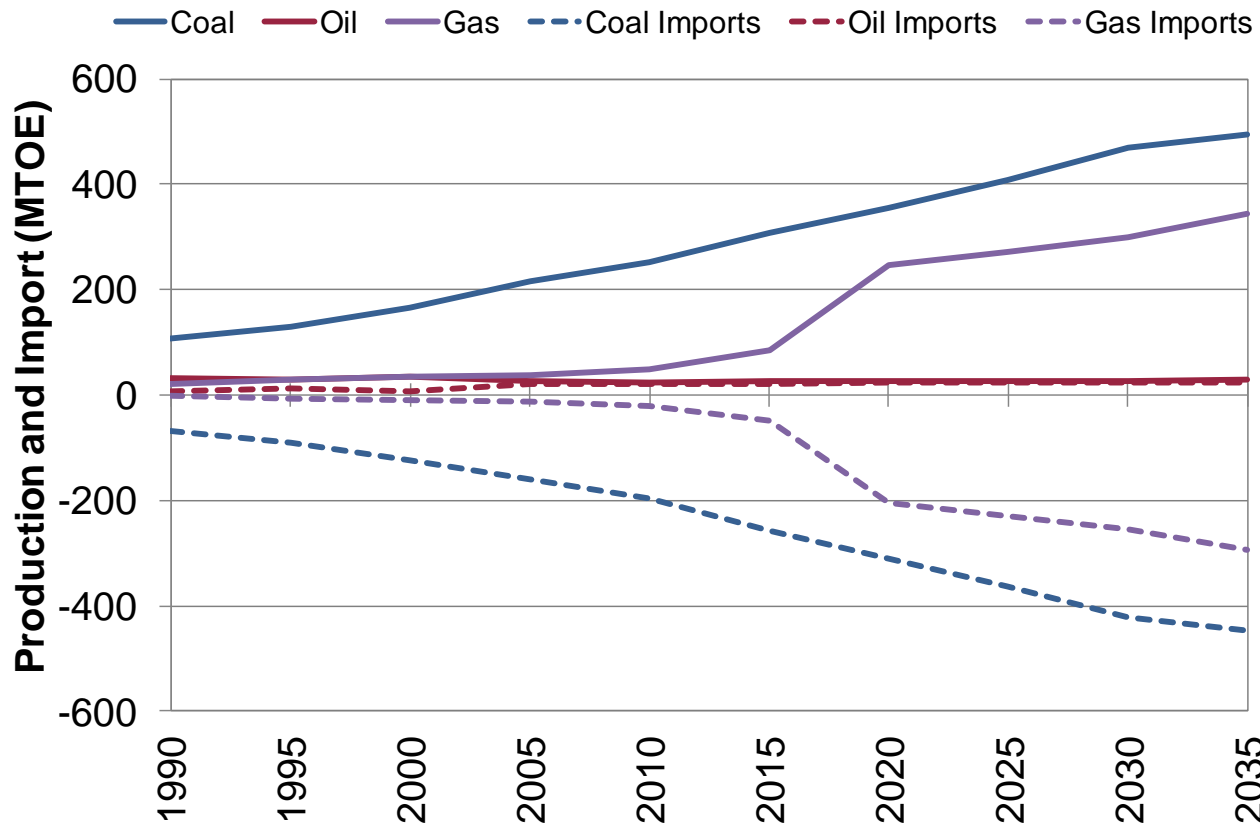
- Alternative cases to business-as-usual will be developed over the next few months and included in the Outlook
- Writing of Volume 1 and the remaining writing of Volume 2, including editing by a professional editor
- Peer reviews of the results for each economy will be invited through APEC EGEDA representatives late this year
- The complete Outlook is expected to be published by the end of the year

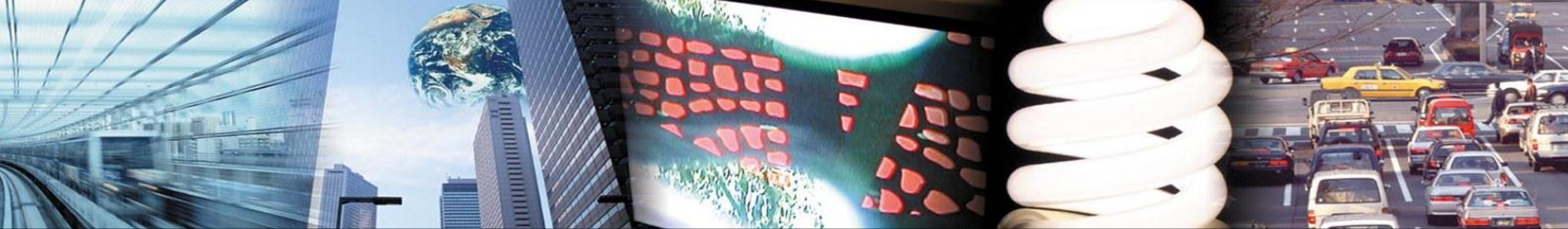


South Pacific Business-As-Usual

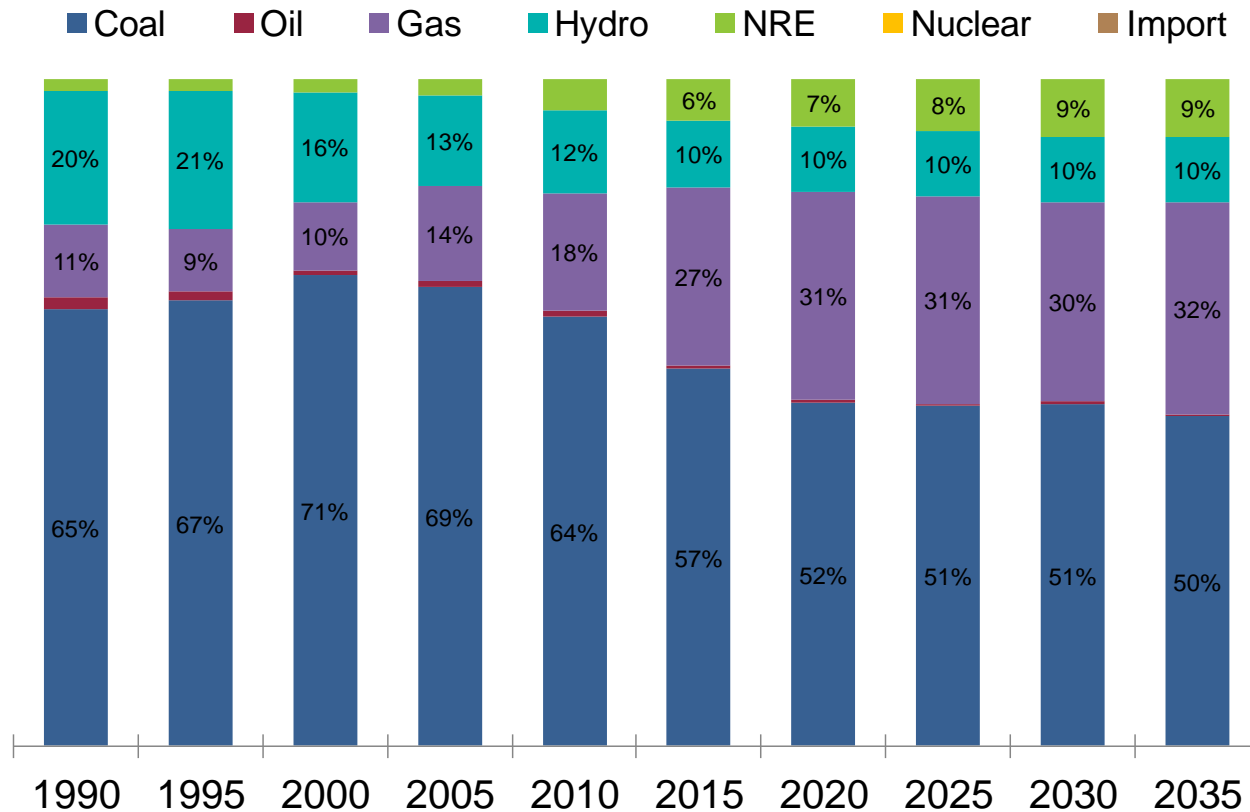


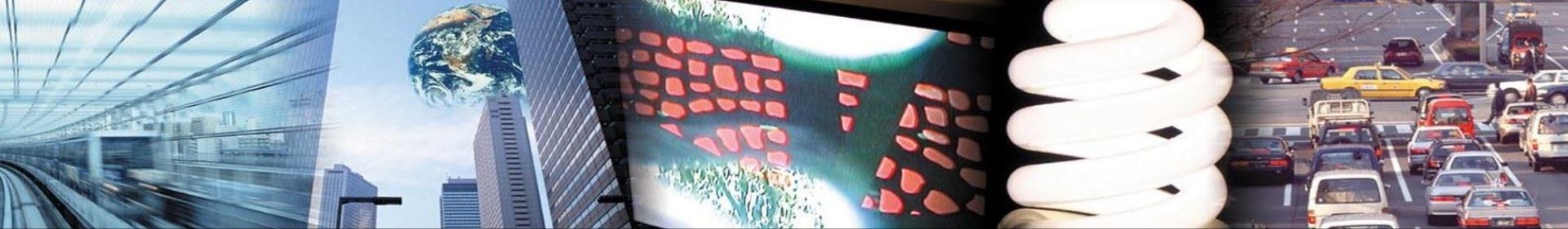
South Pacific Will Be a Rapidly Growing Gas Producer and Exporter



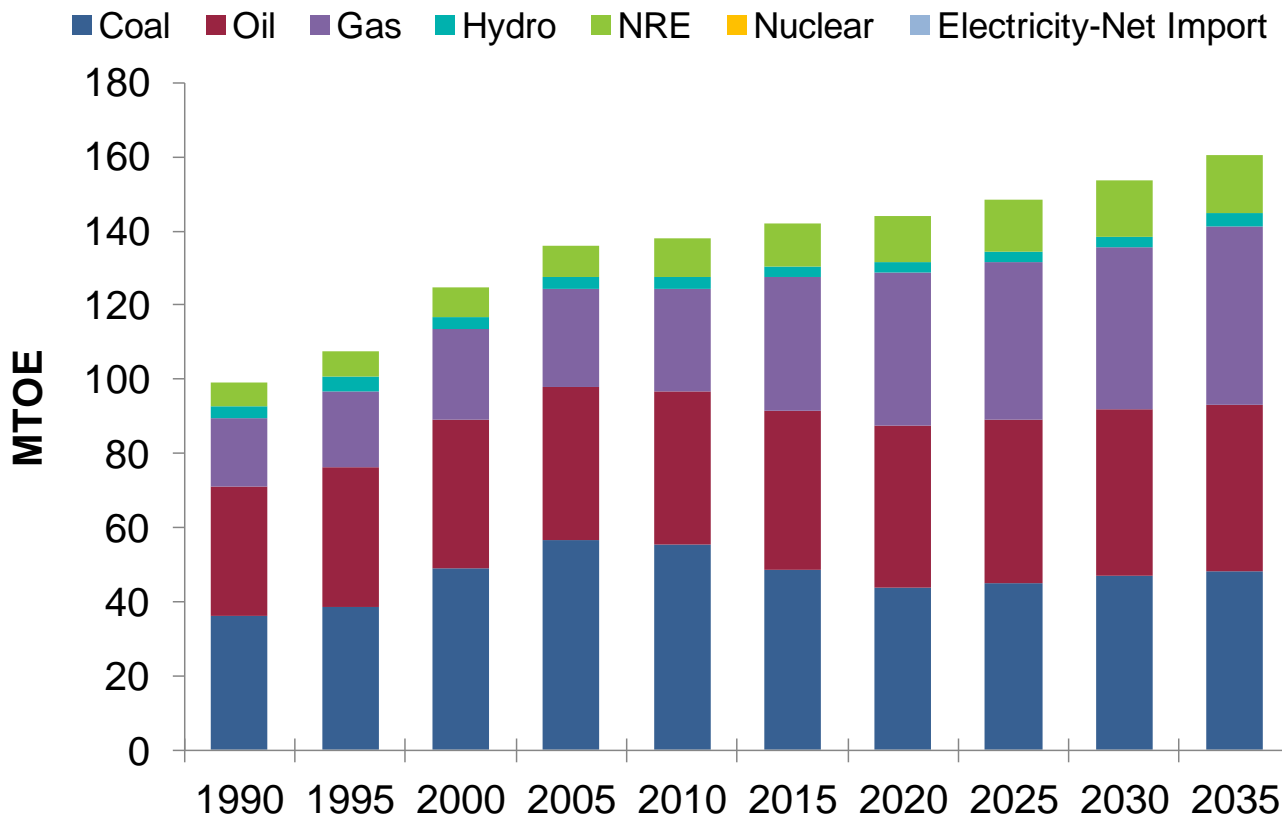


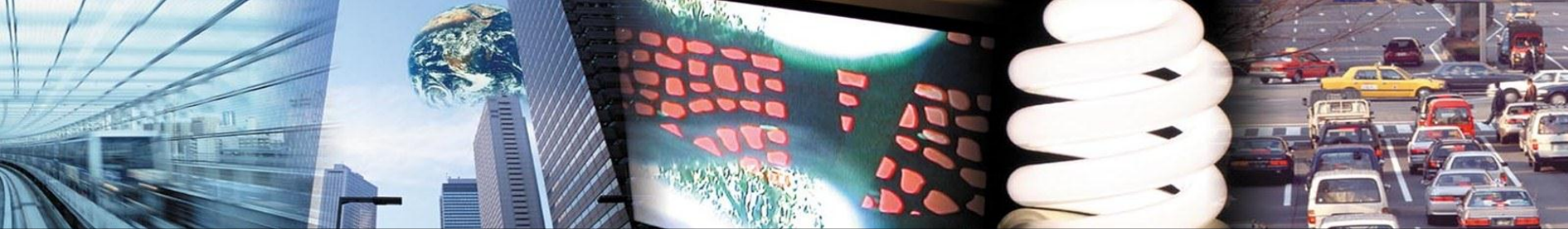
Gas and NRE Have Growing Roles in South Pacific Electricity Generation



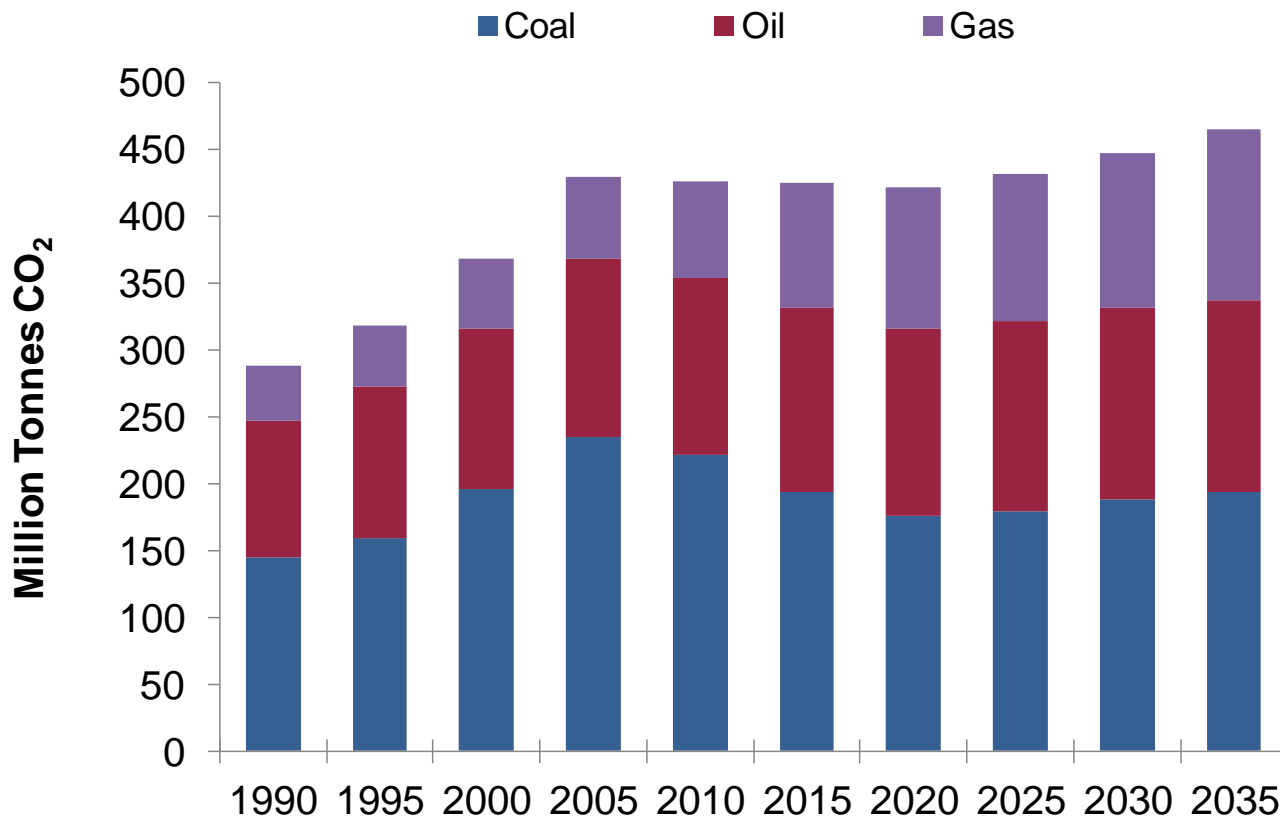


And Growth in South Pacific Primary Energy Demand is in Lower-Emissions Fuels



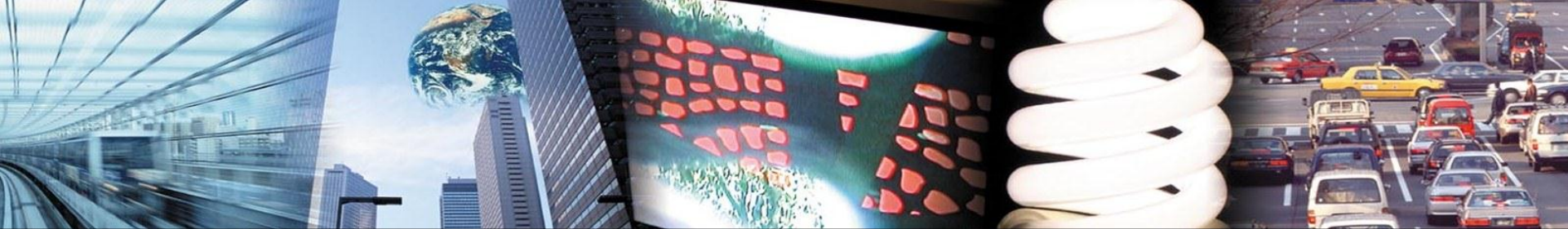


Consequently, South Pacific CO₂ Emissions Almost Level Off

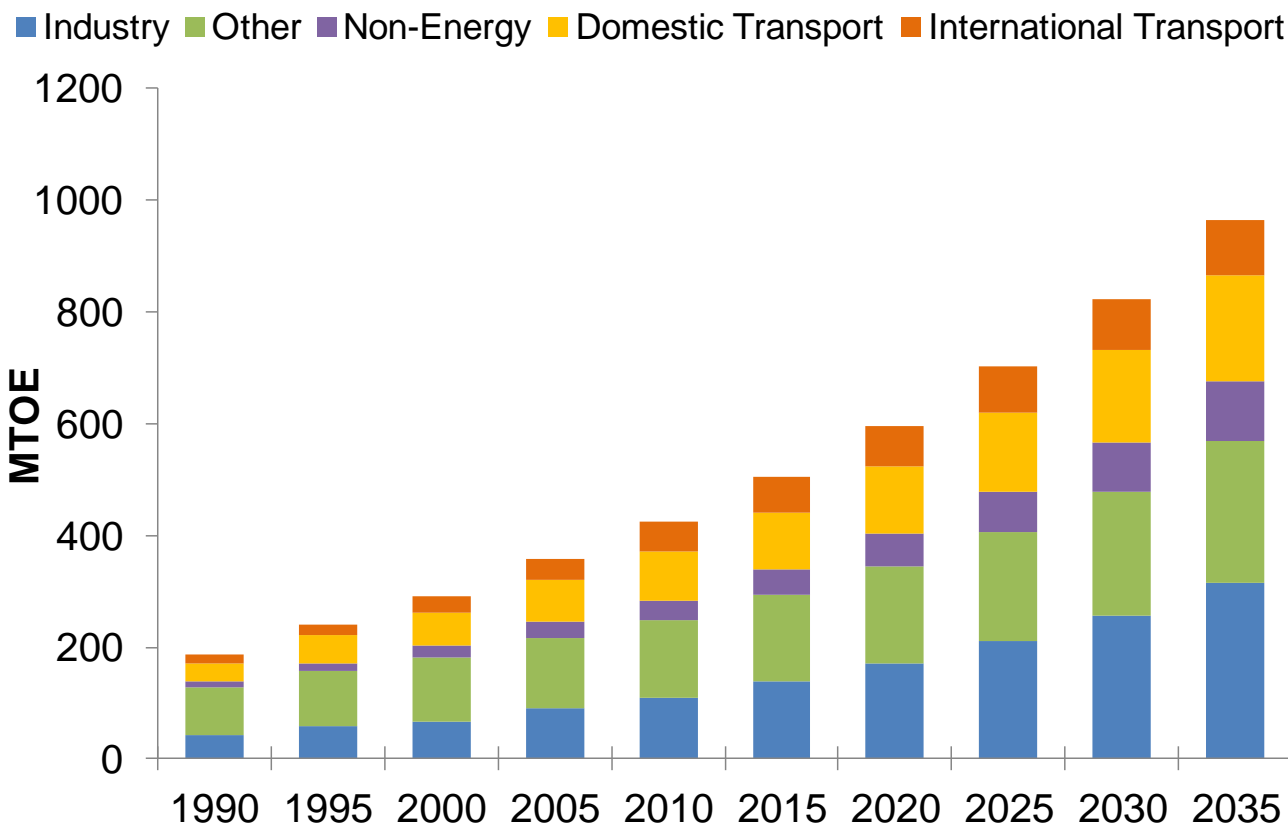


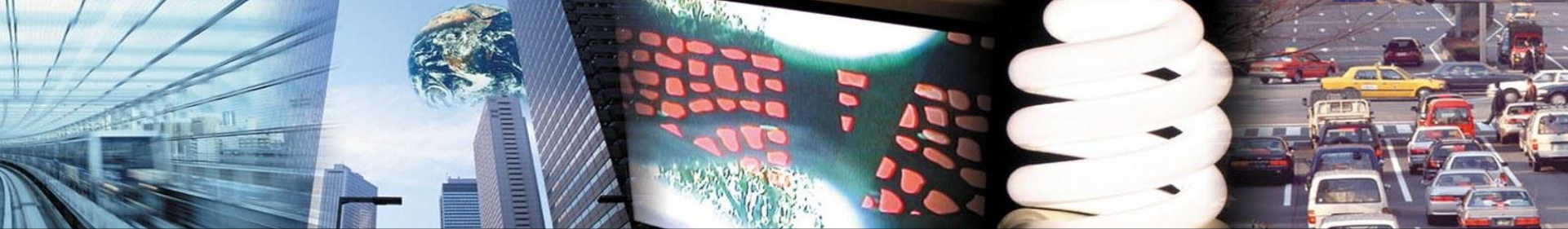


Southeast Asia Business-As-Usual

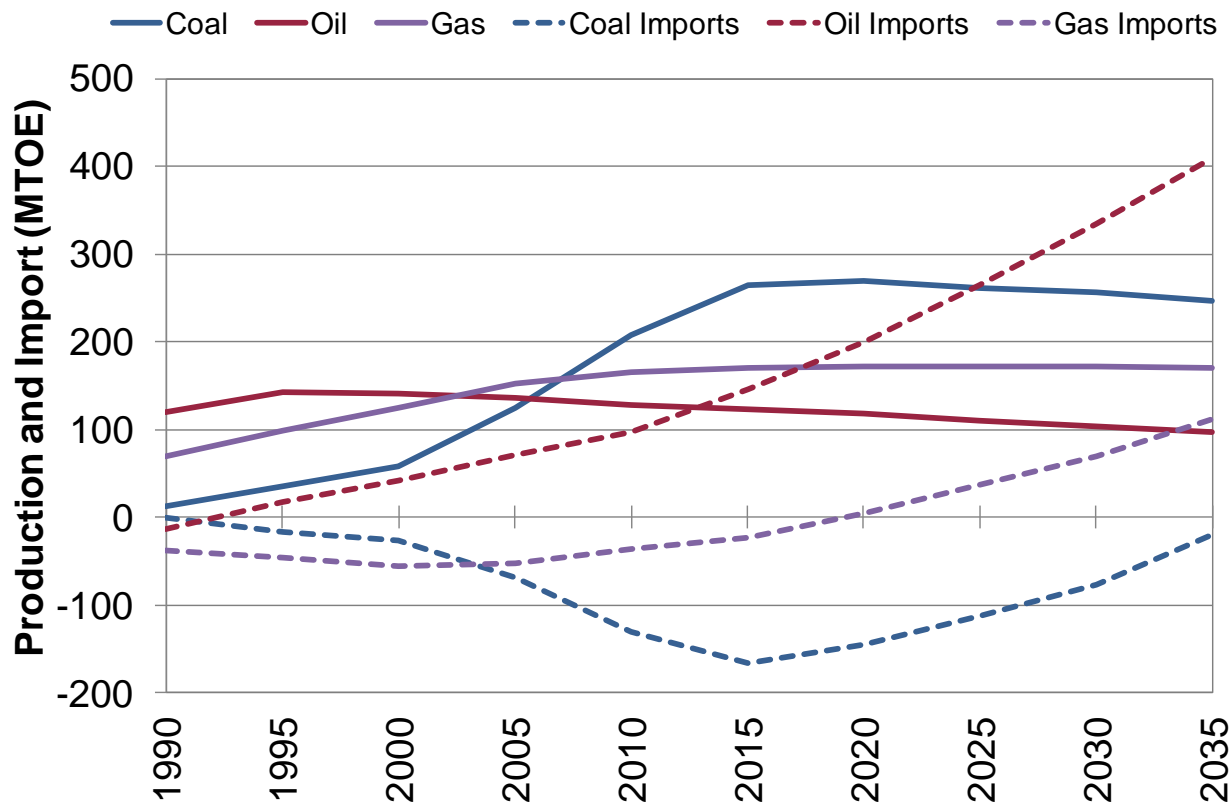


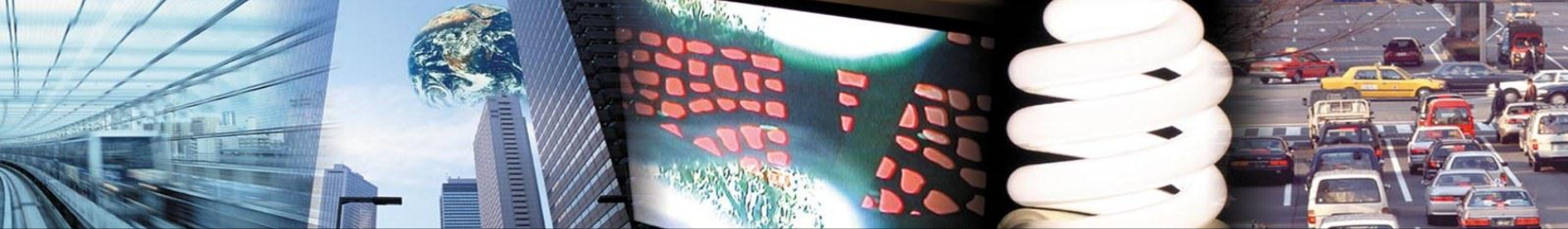
Southeast Asia Demand for Fossil Fuels Will Grow Quickly



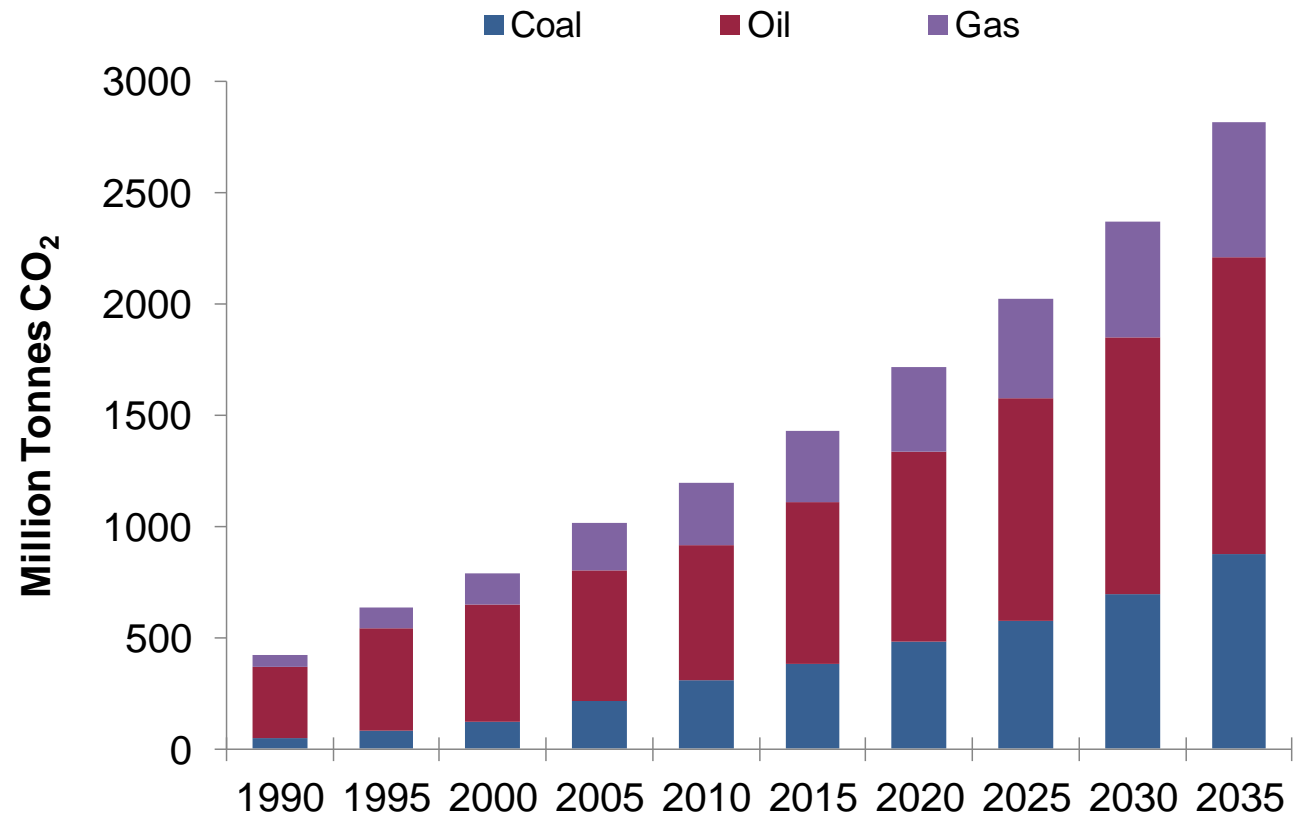


Consequently, SE Asia Will Become Net Gas Importer and Growing Oil Importer



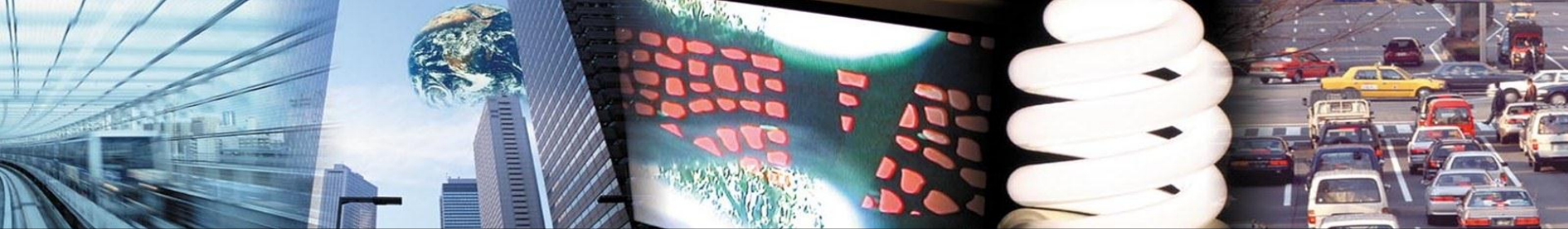


And Southeast Asia CO₂ Emissions will Grow Rapidly

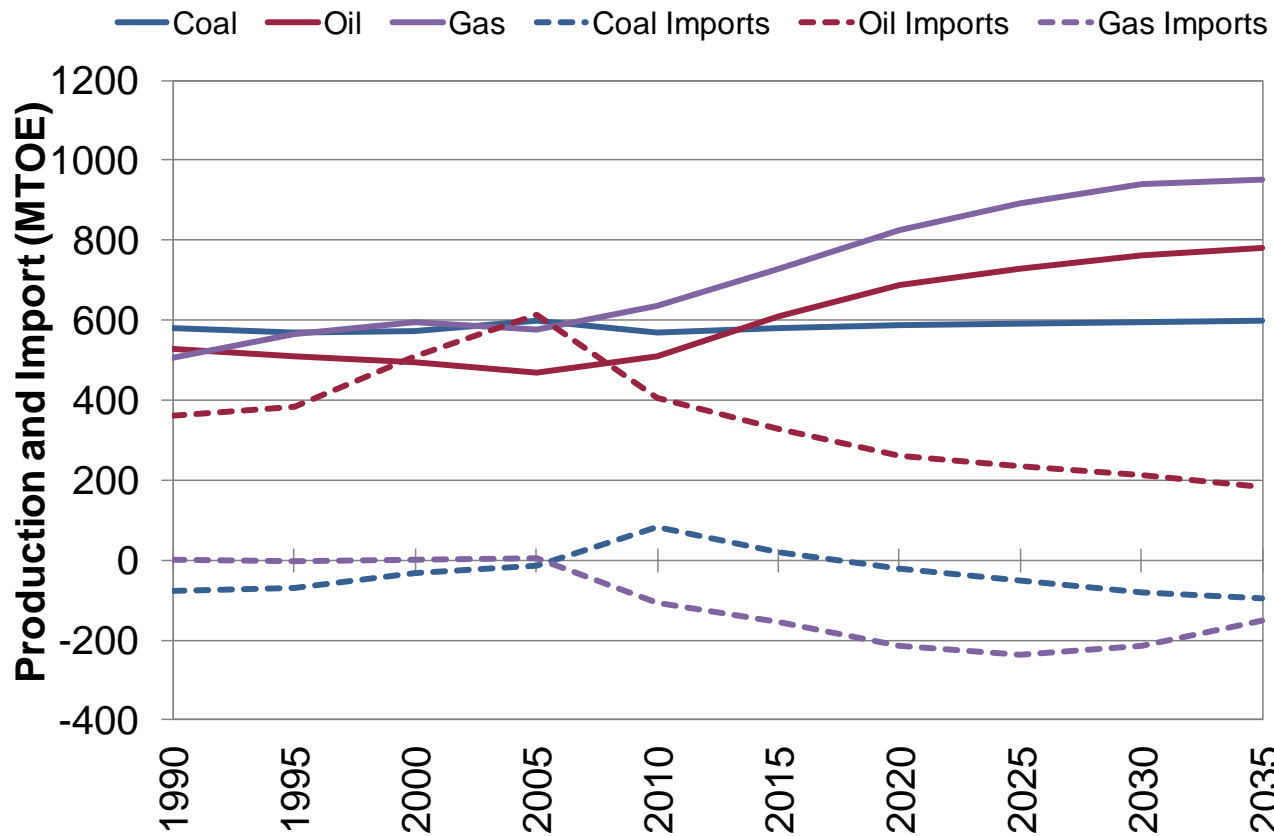


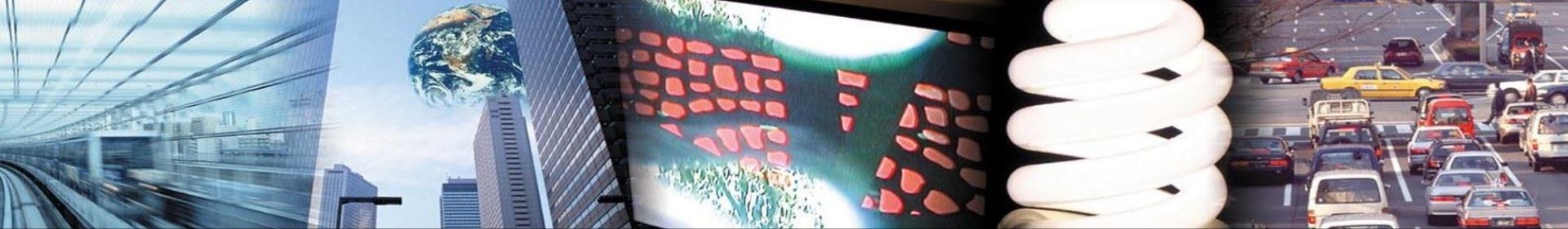


North America Business-As-Usual

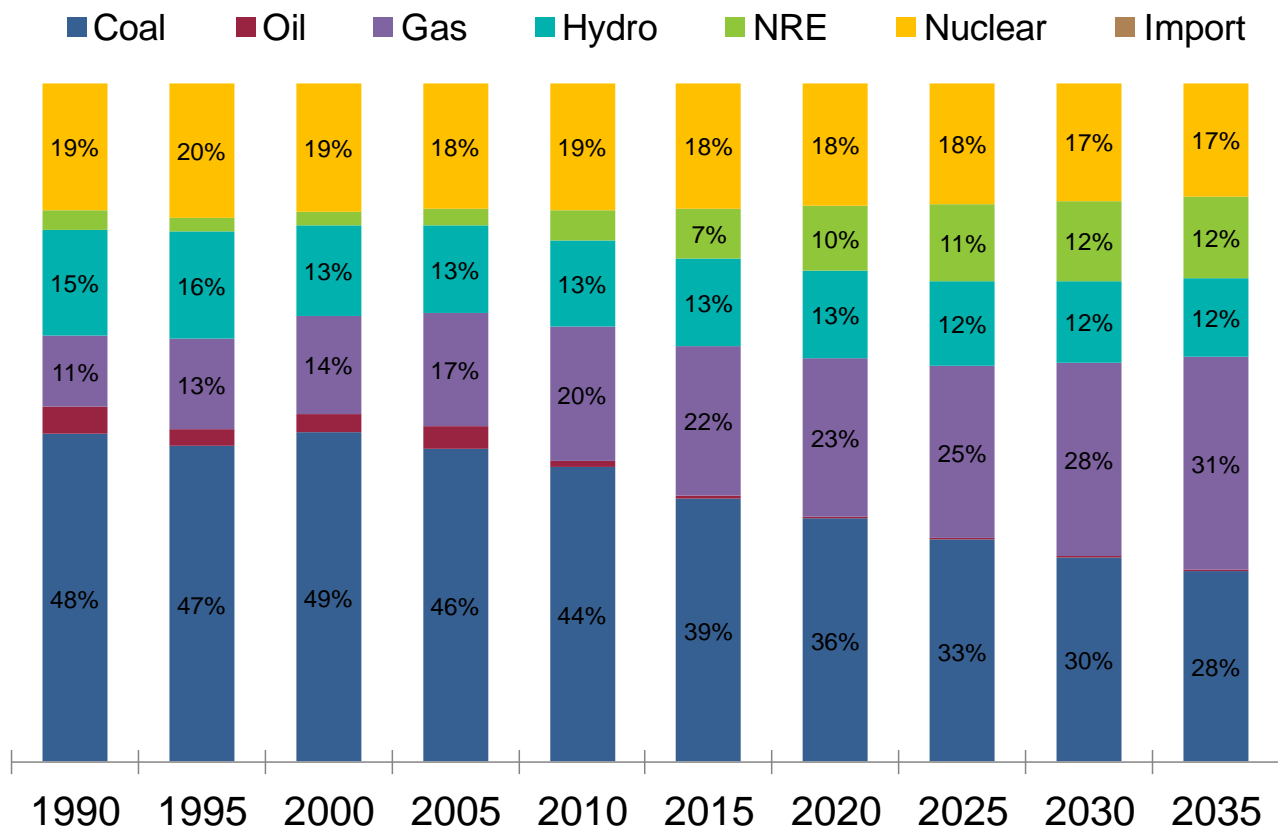


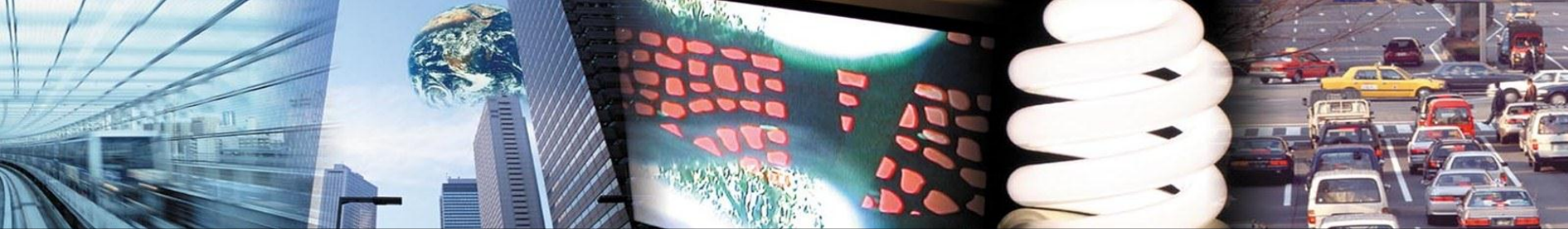
North America Will Increase Oil and Gas Production



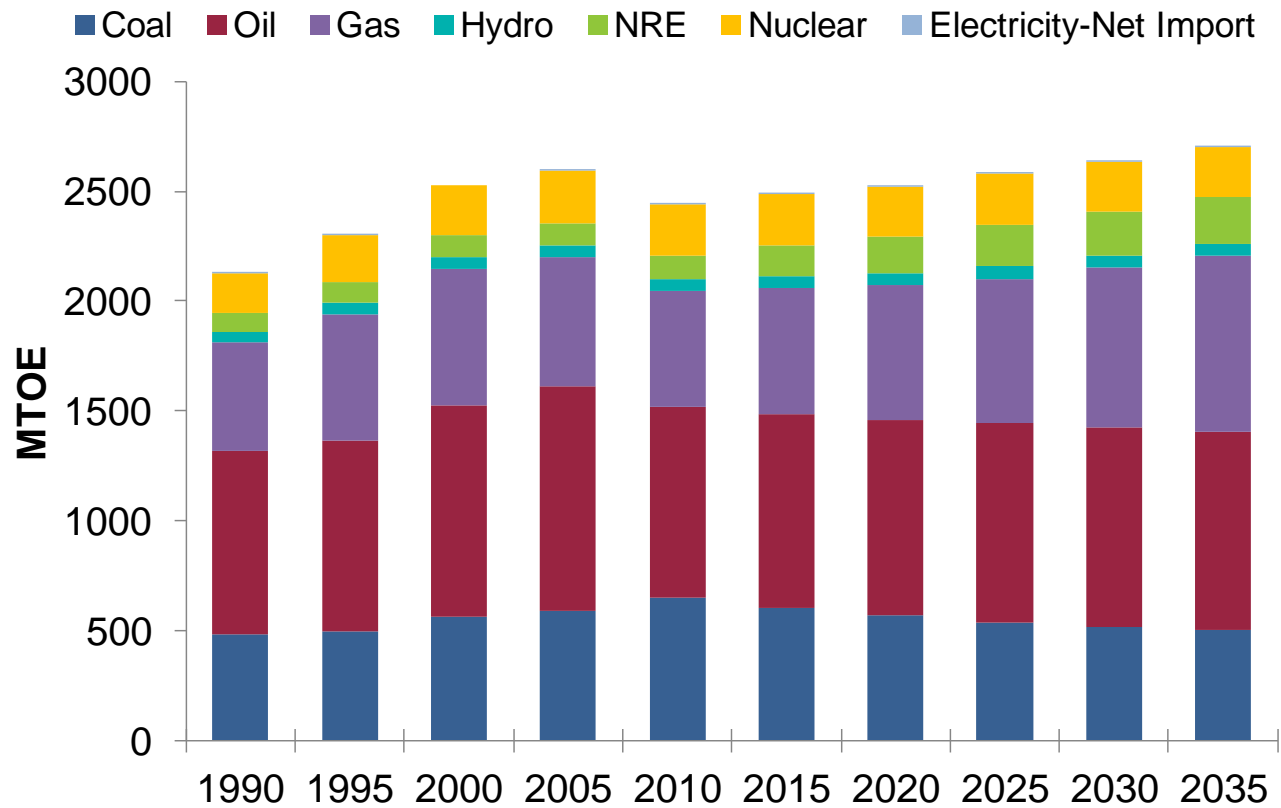


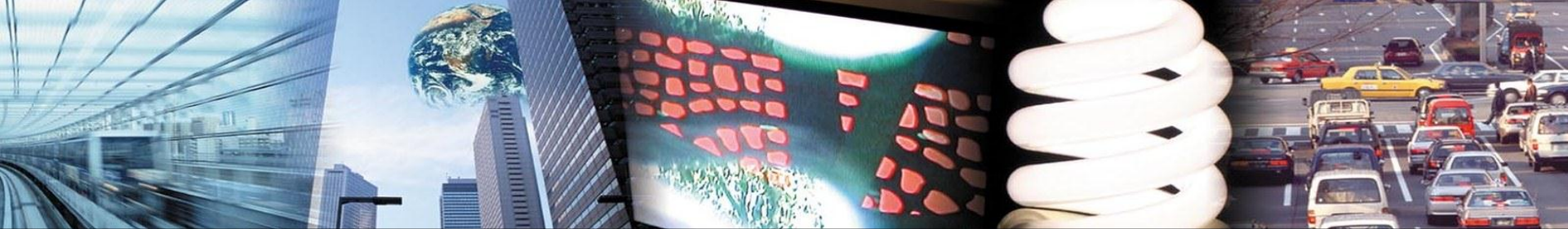
N.A. Gas and Renewables Have Increased Roles in Electricity Generation



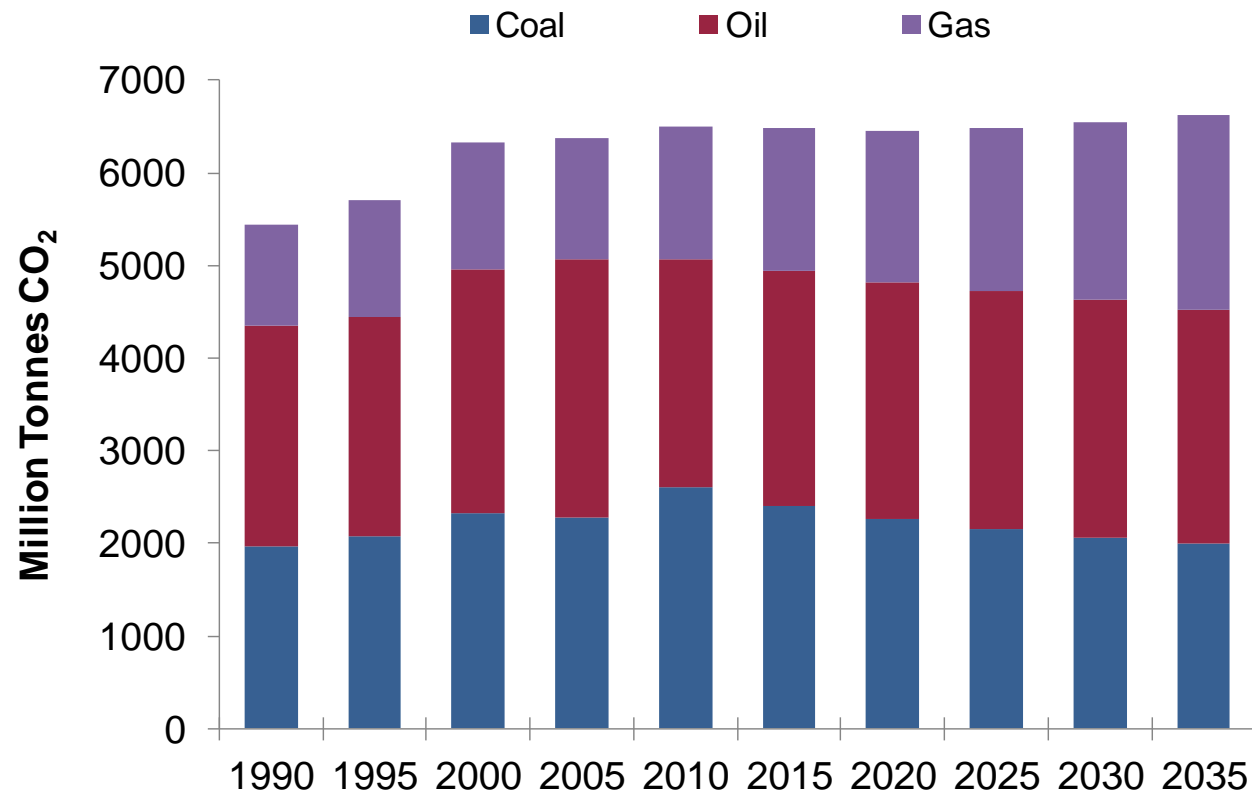


And N.A. Growth in Primary Energy Demand is in Low-Emissions Fuels



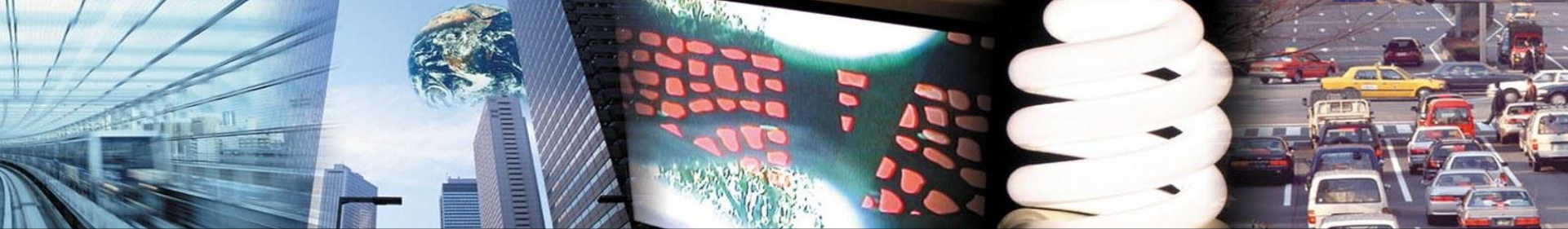


Consequently, North American CO₂ Emissions Level Off

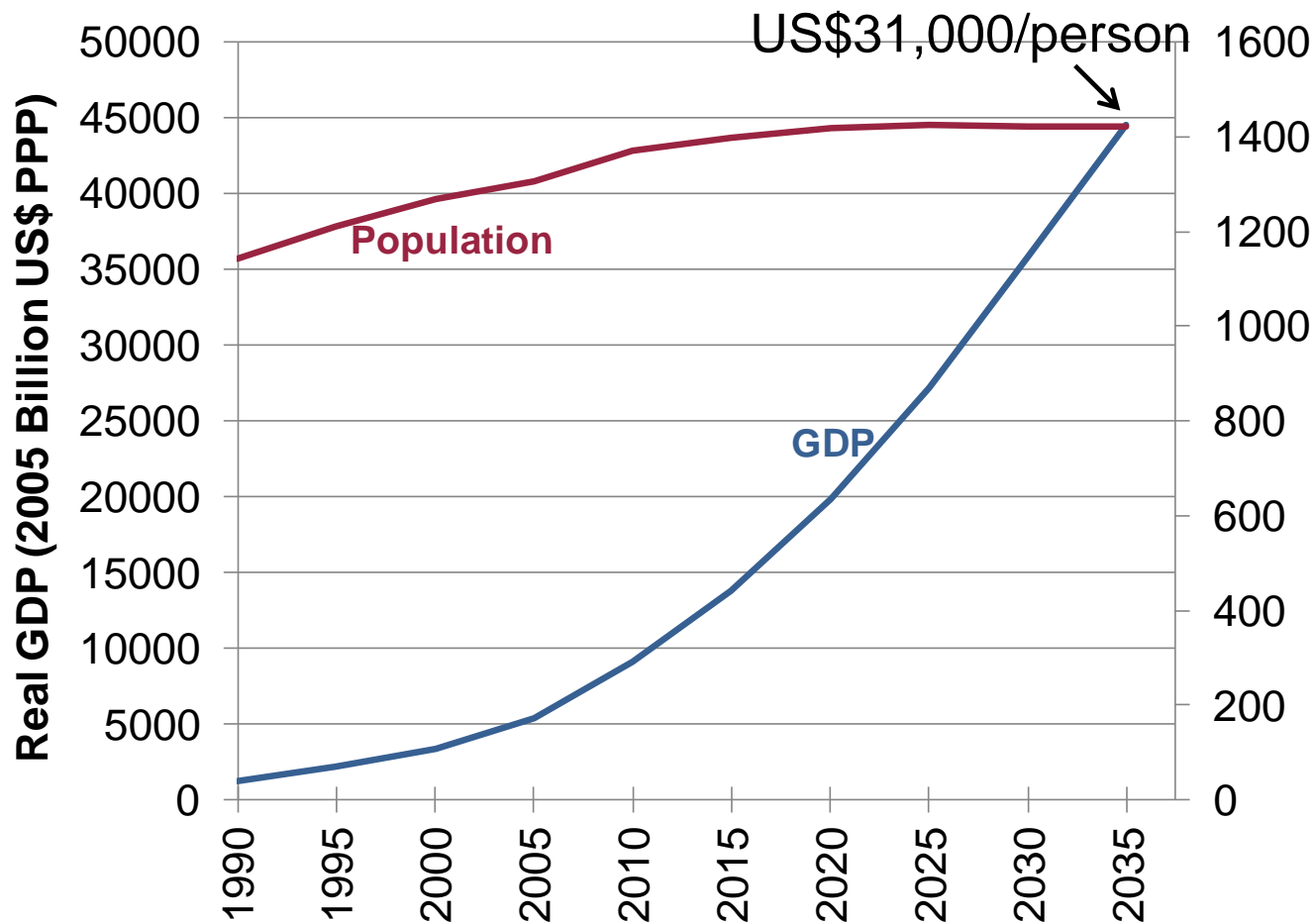




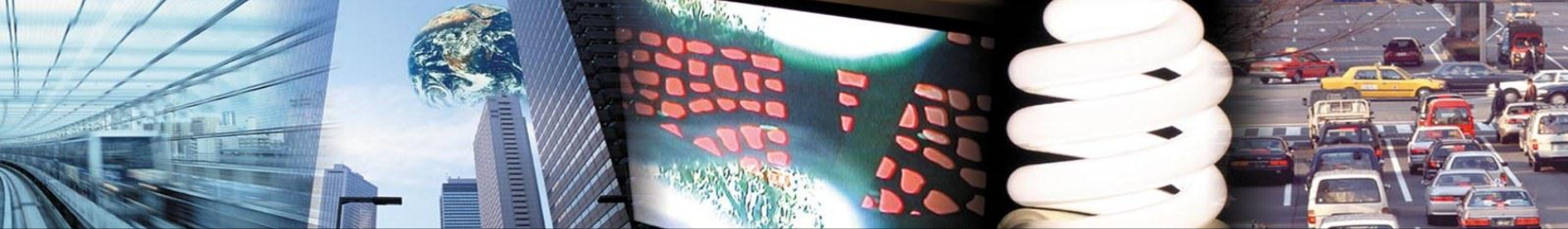
Northeast Asia Business-As-Usual



The Incredible Chinese Growth Story Continues

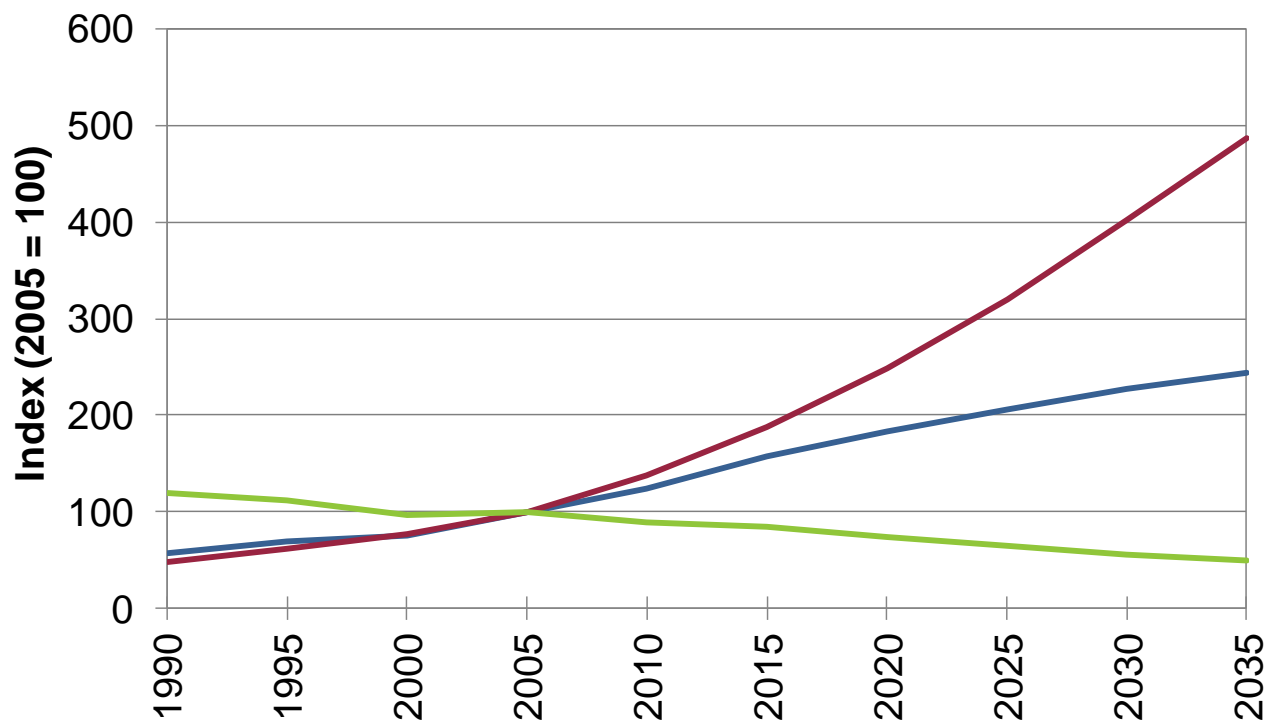


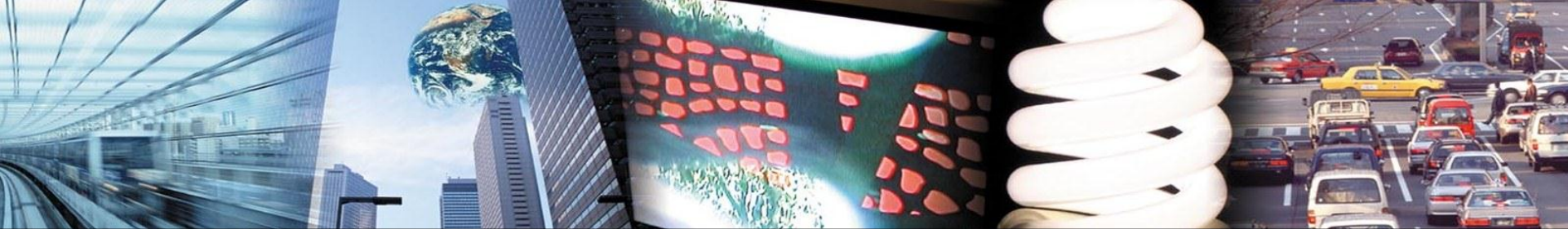
Assumed China
 GDP Growth Rates:
 2010-2020: 8.1%
 2020-2030: 6.0%
 2030-2035: 4.5%



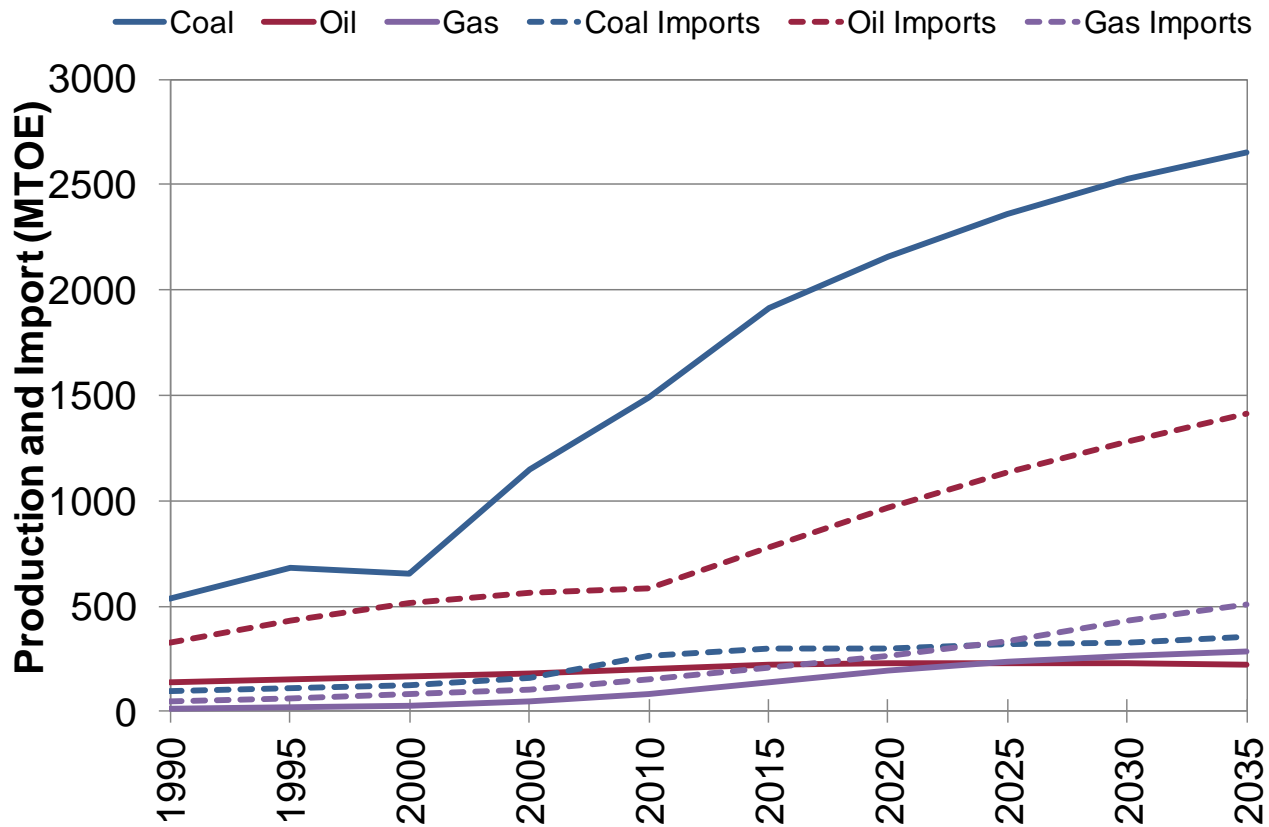
NE Asia Primary Energy Demand Grows

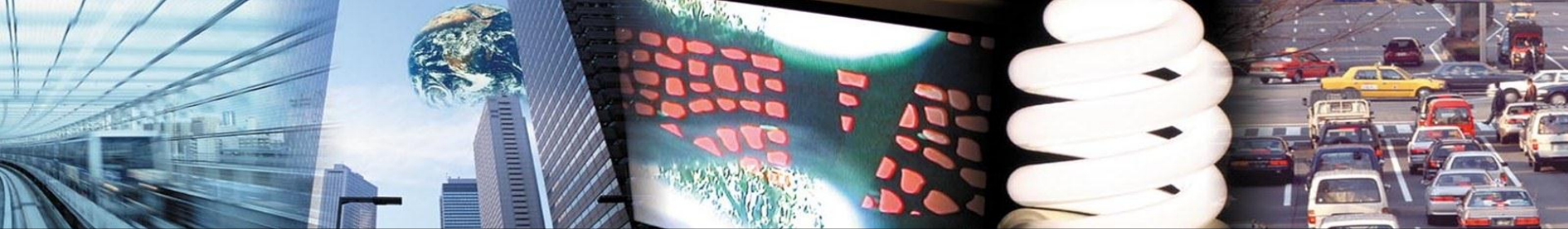
— Total Primary Energy Supply Index — GDP Index — Primary Energy Intensity Index



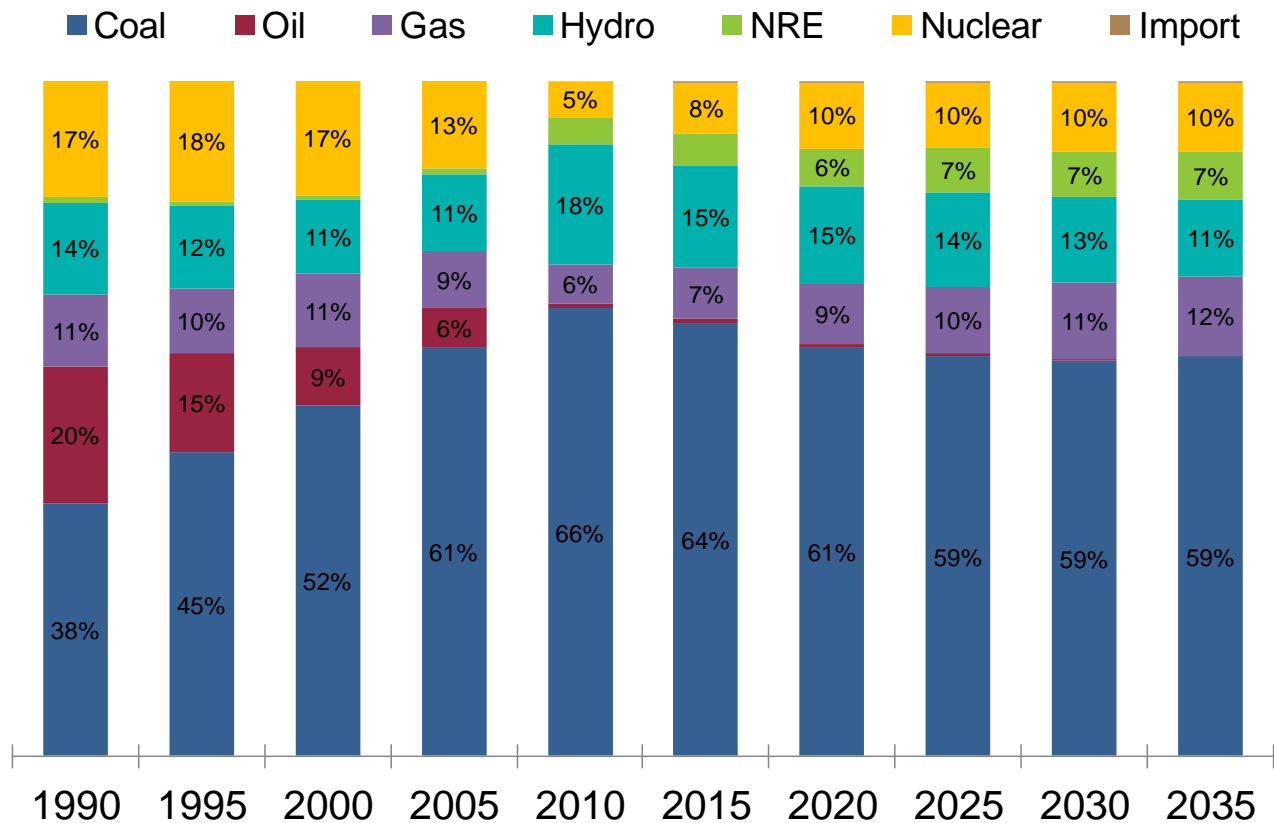


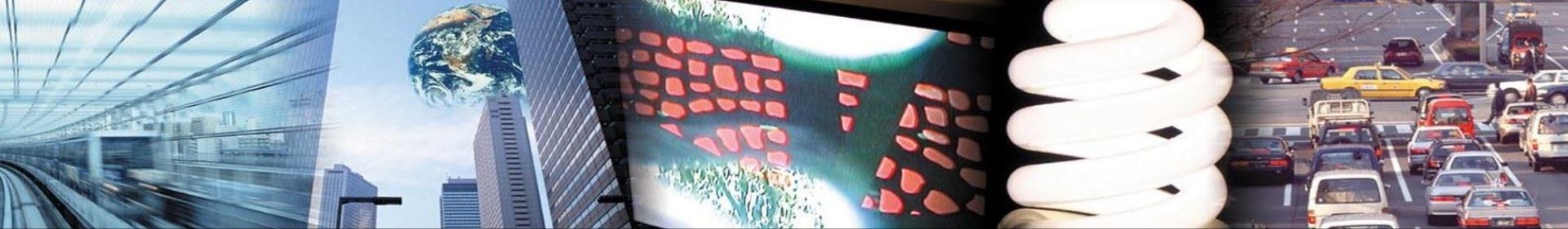
Although China's Energy Production Grows, NE Asia Oil Imports Grow Rapidly



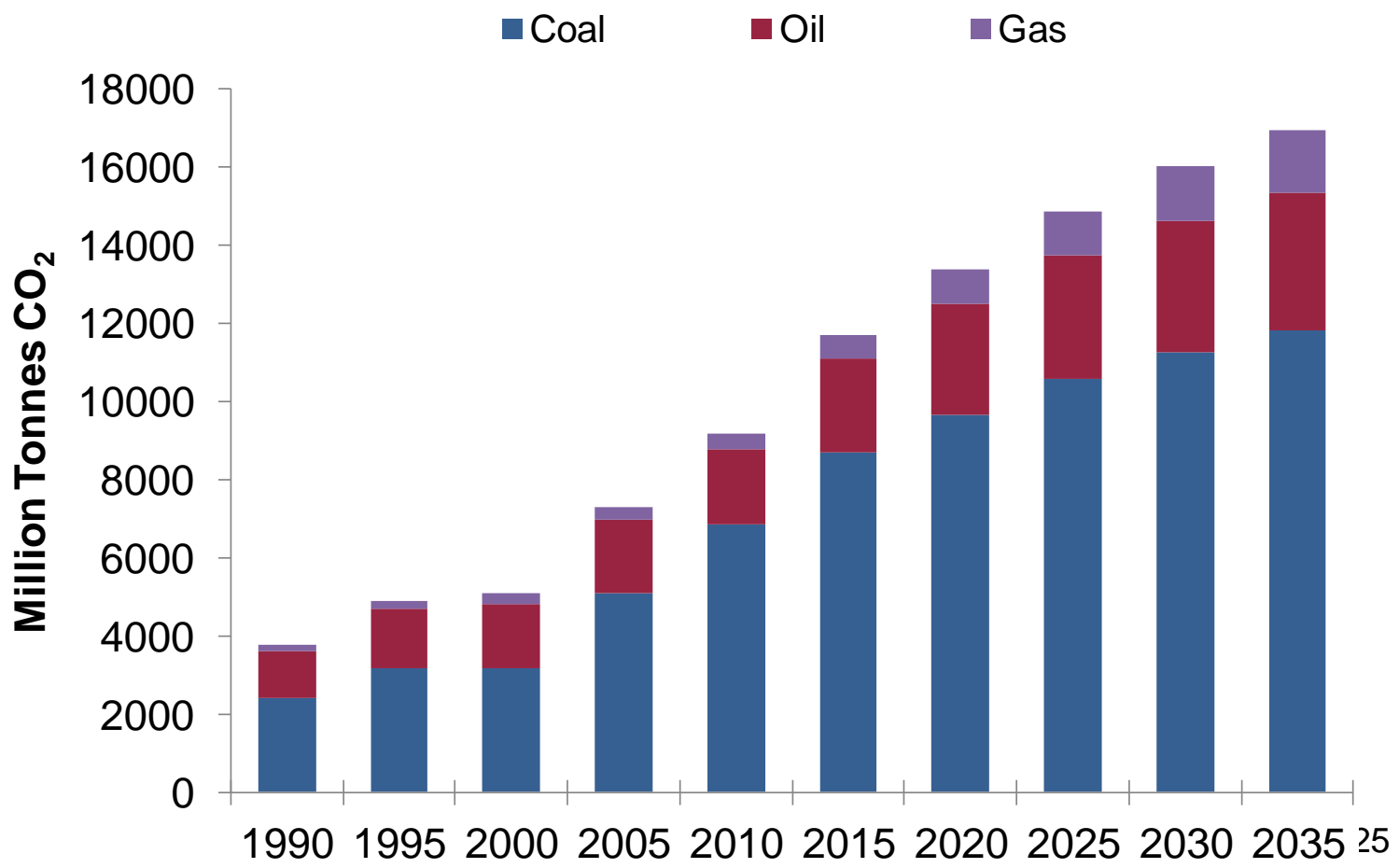


NE Asia Nuclear, NRE, Hydro, and Gas Generation Grow, But Coal is Still King



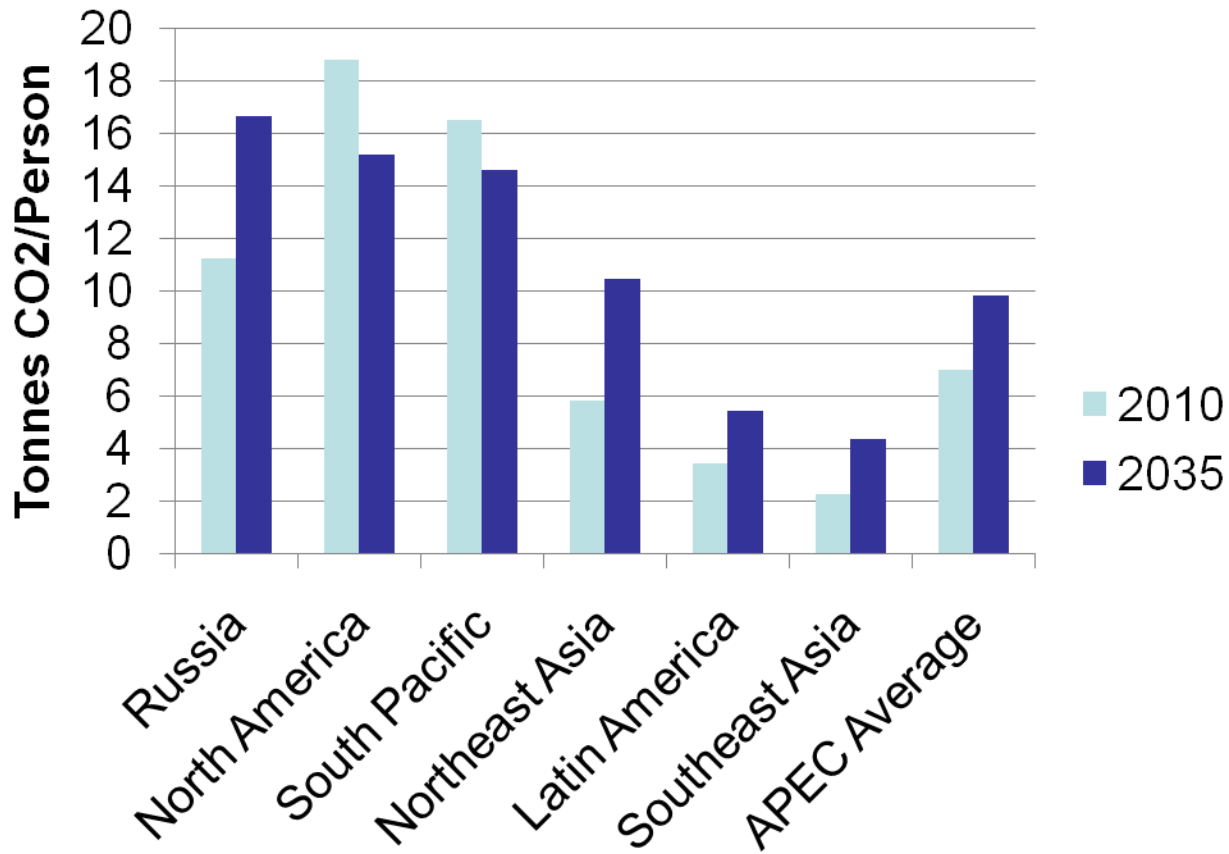


So Northeast Asia's CO₂ Emissions Grow...



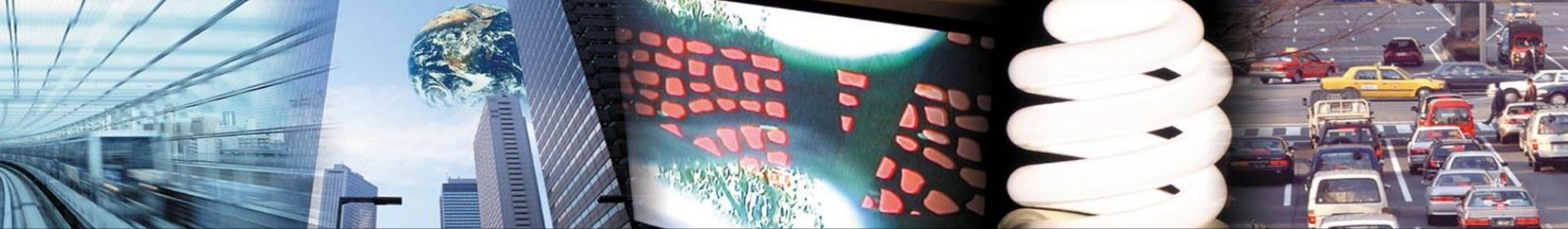


...But Per Person CO2 Still Remains About Average for APEC

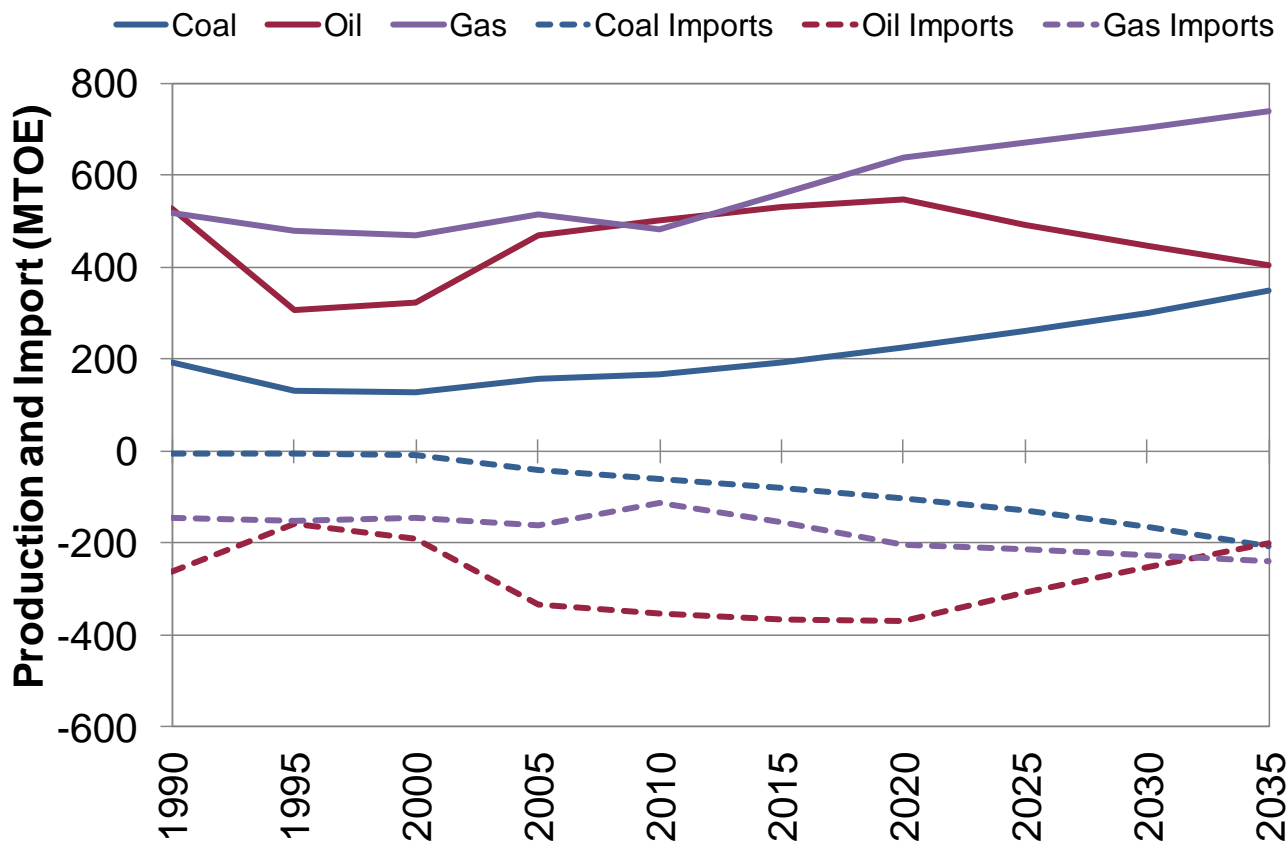


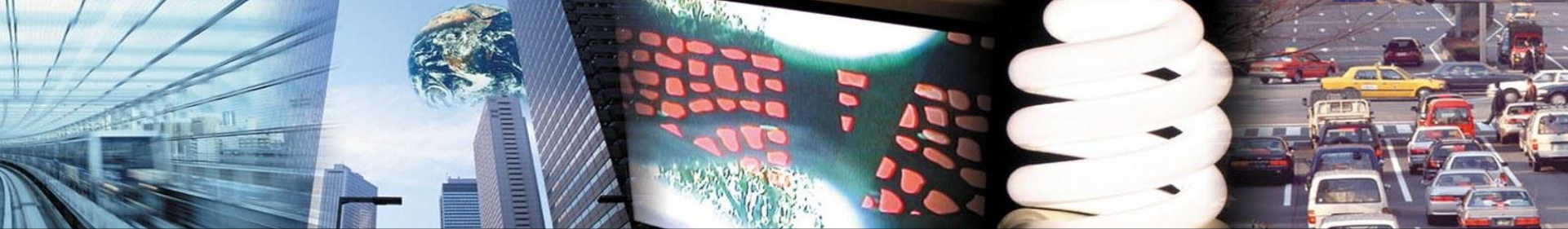


Russian Federation Business-As-Usual

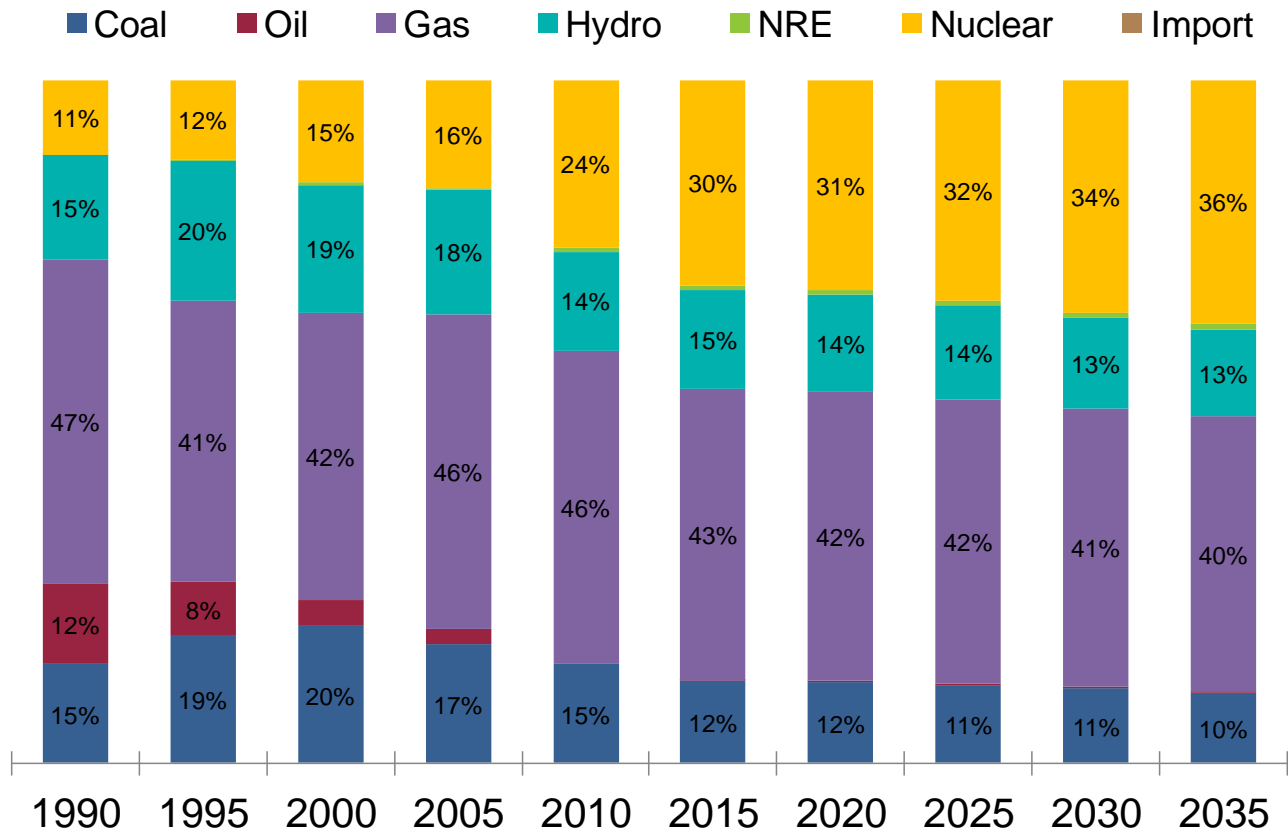


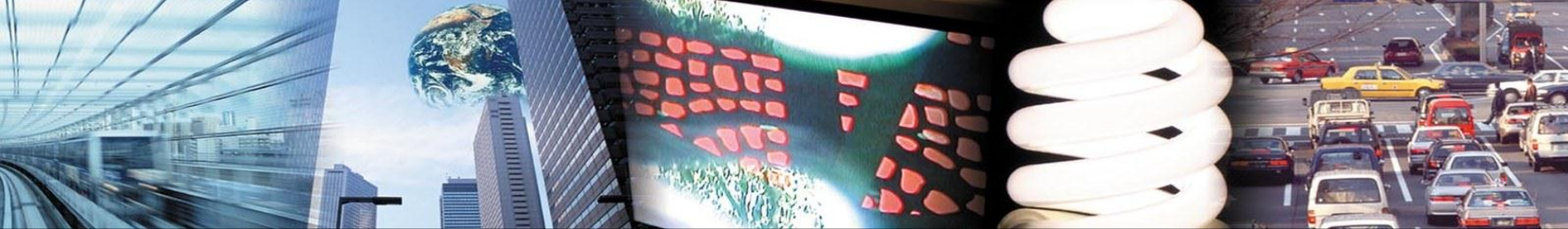
Russia's Gas Production and Exports Grow, But Oil Production and Oil Exports Peak Then Decline



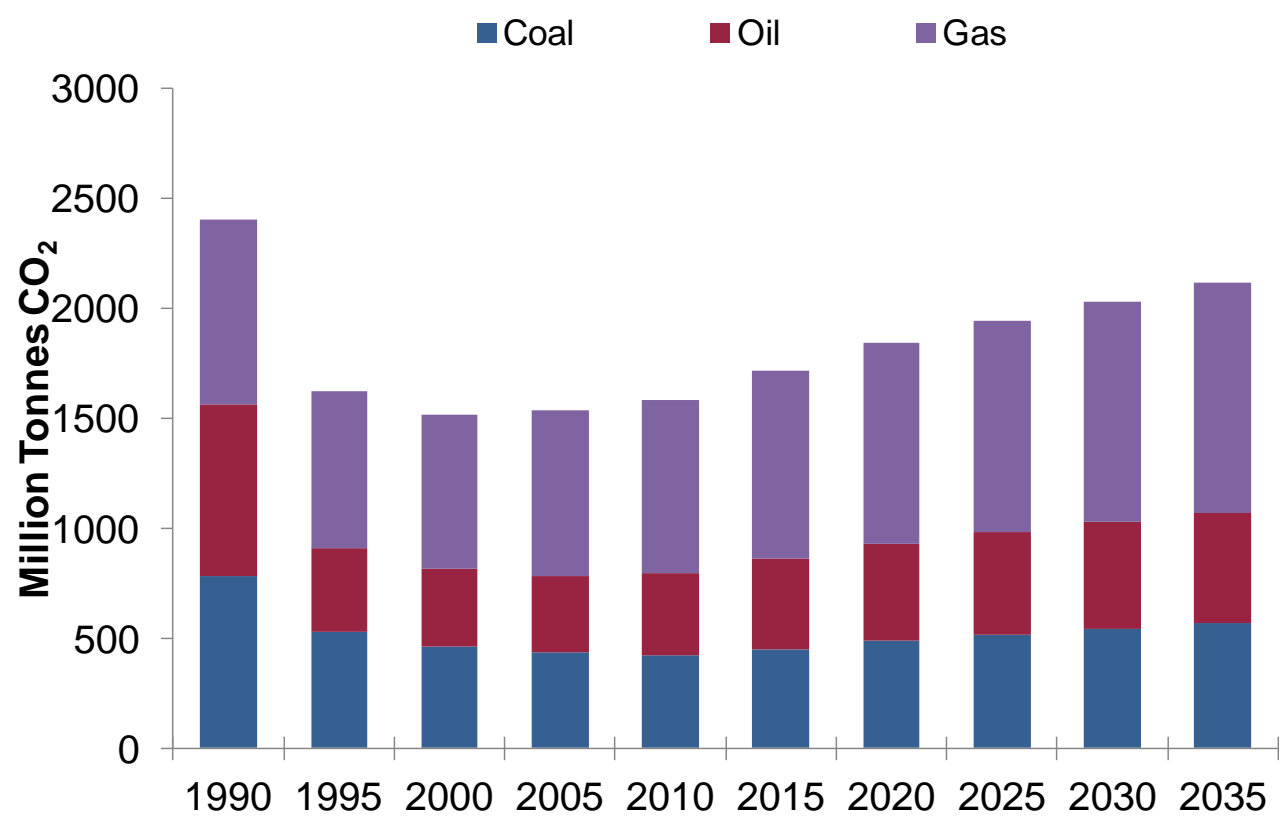


Russia's Nuclear Generation Continues to Grow...



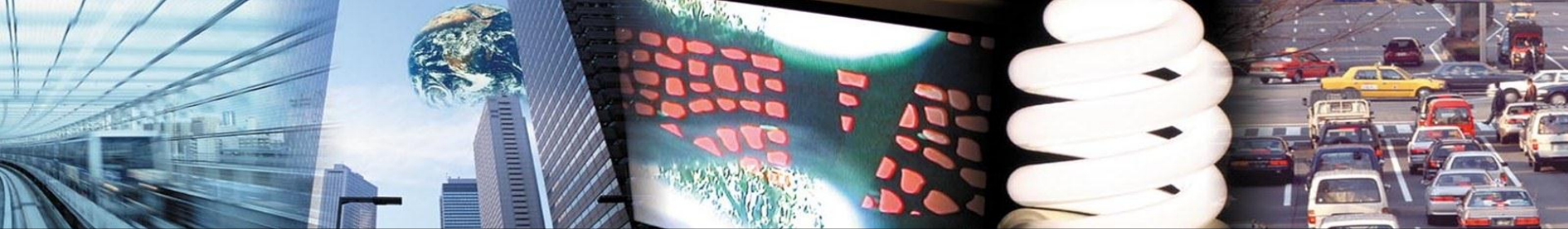


...Slowing the Growth of Russia's CO₂ Emissions

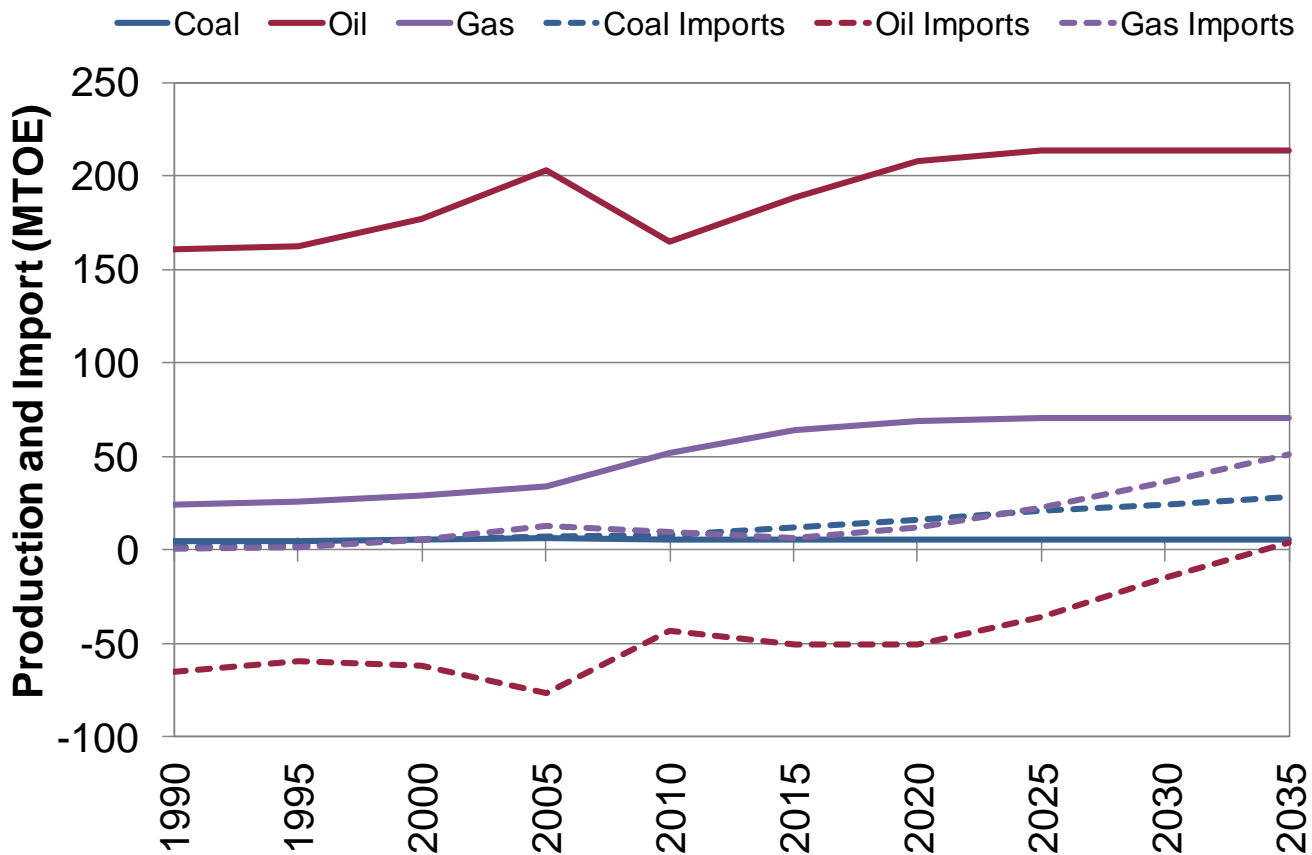


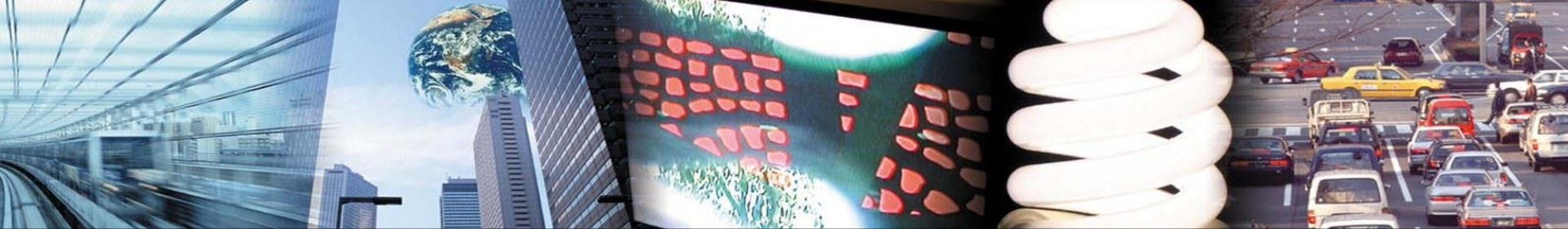


Latin America Business-As-Usual

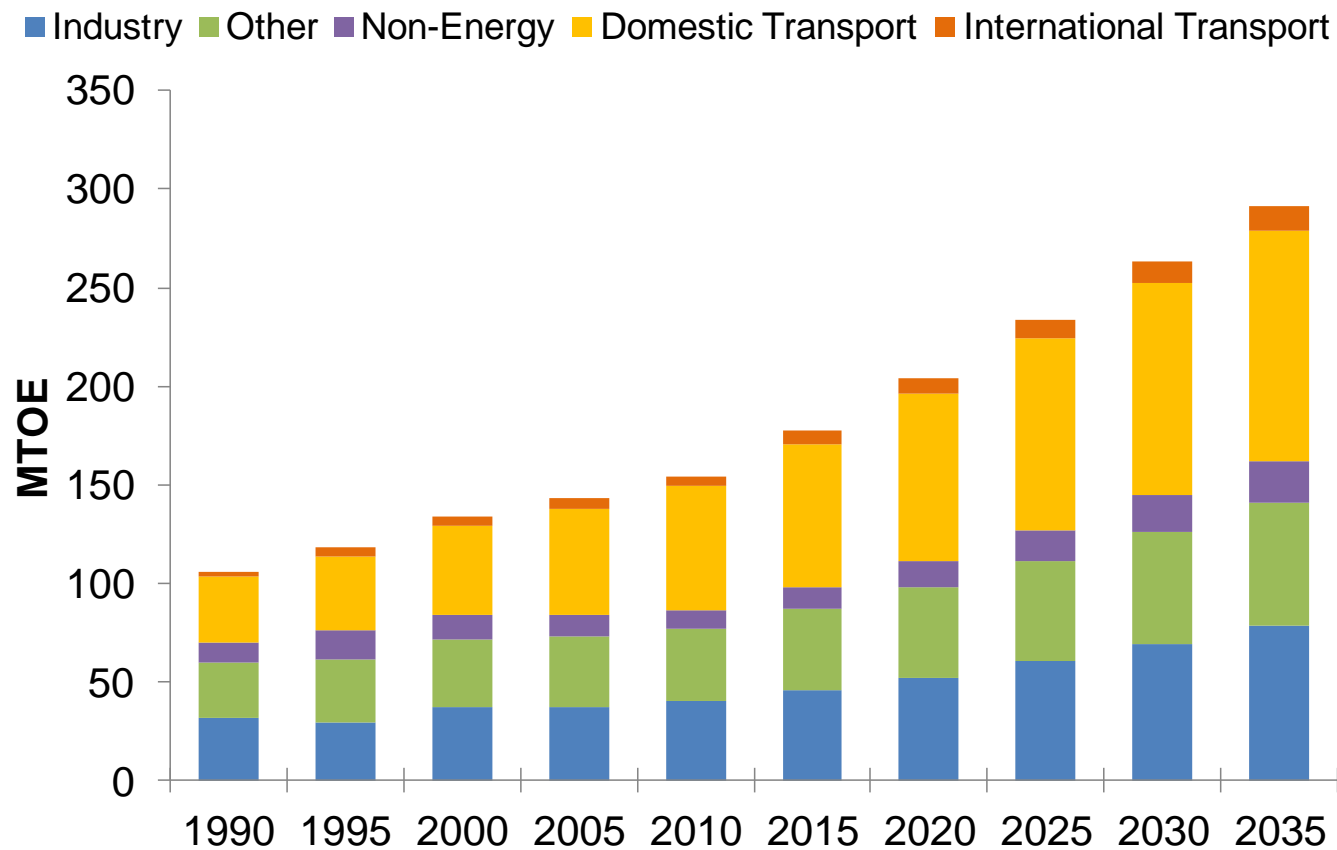


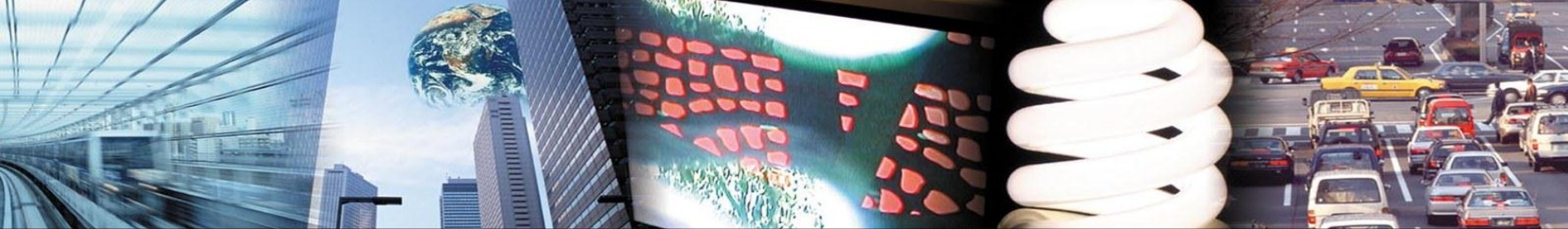
Latin America Energy Gas Production Grows, But Oil Production is More Stagnant



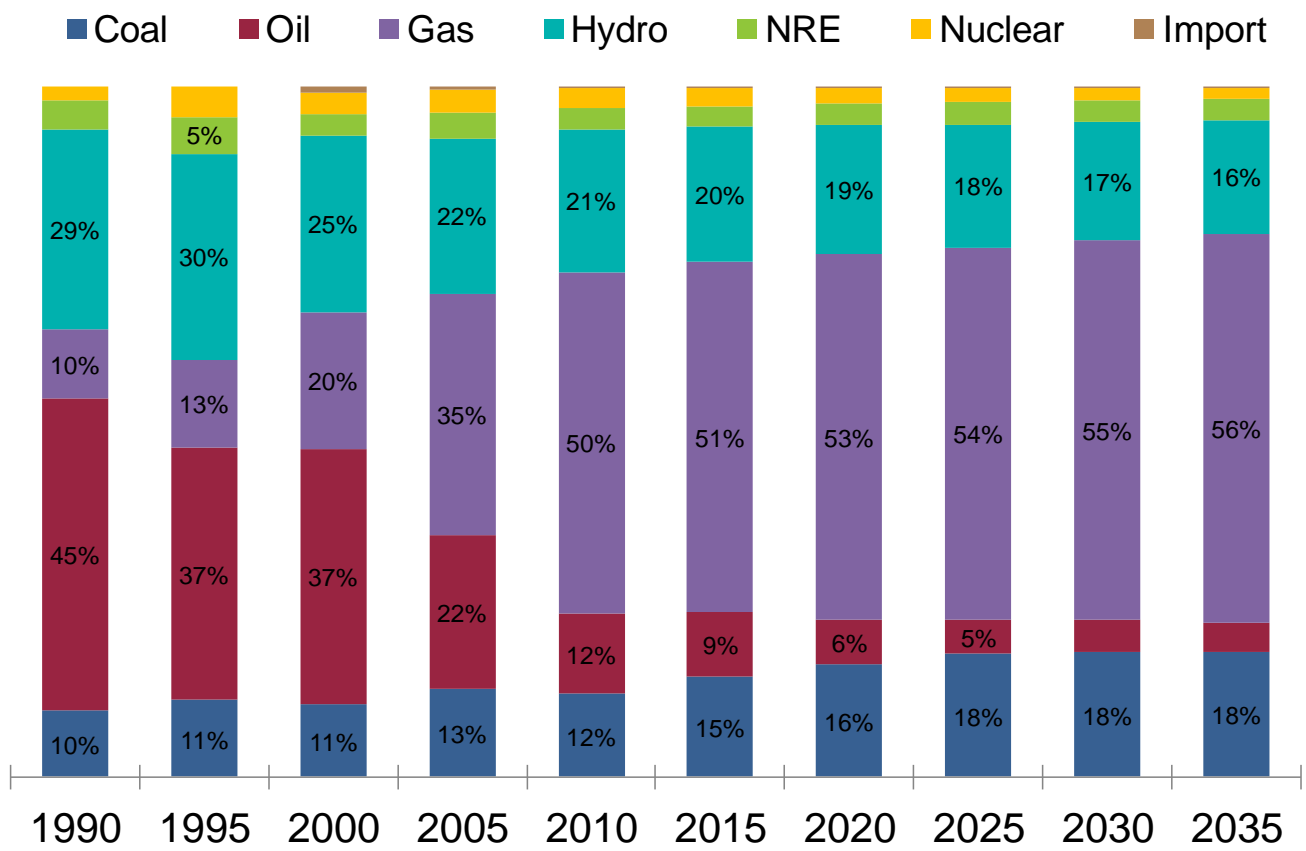


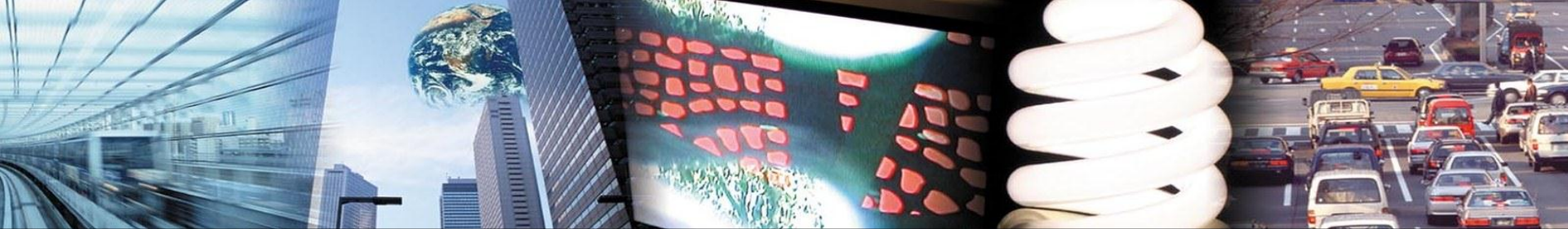
Latin America Final Demand Grows Rapidly in All Sectors



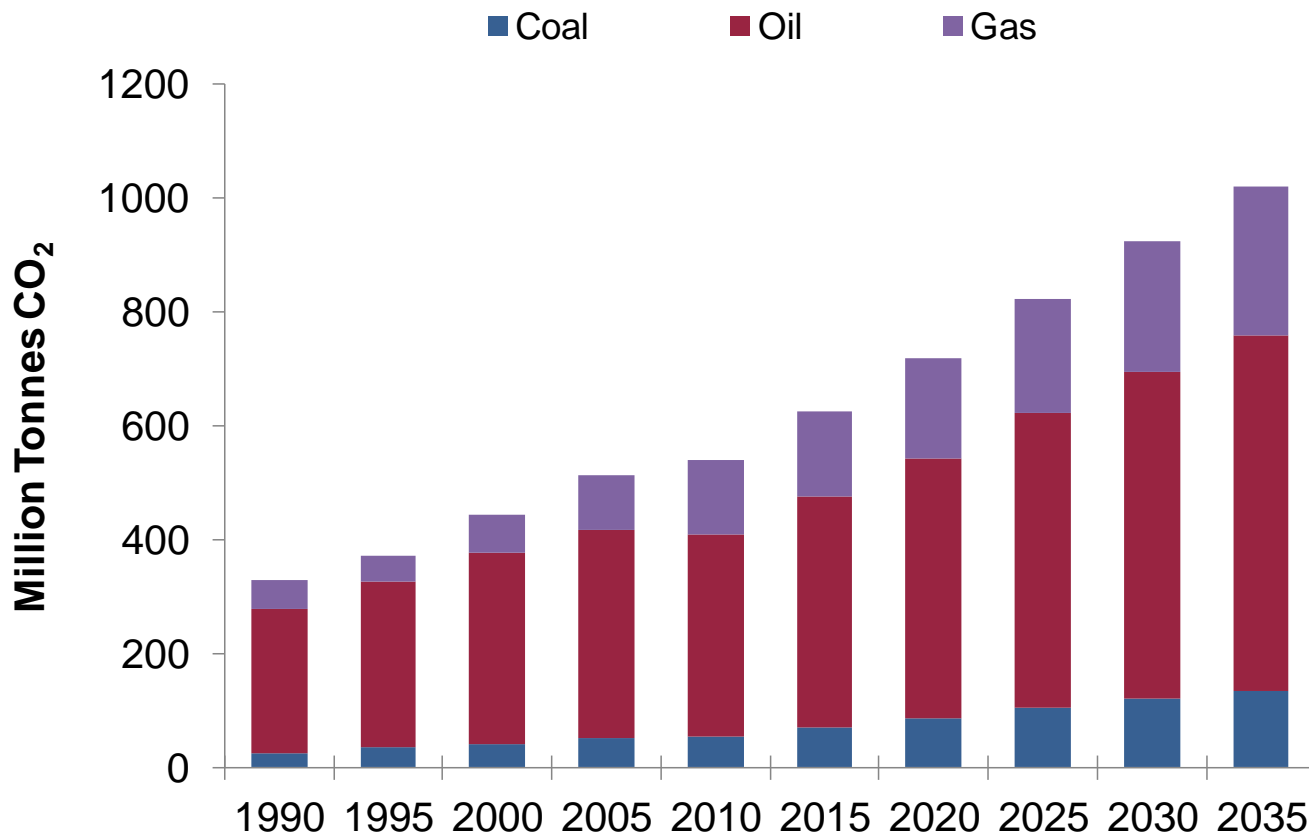


Latin America's Electricity Generation Shows Growing Share of Gas



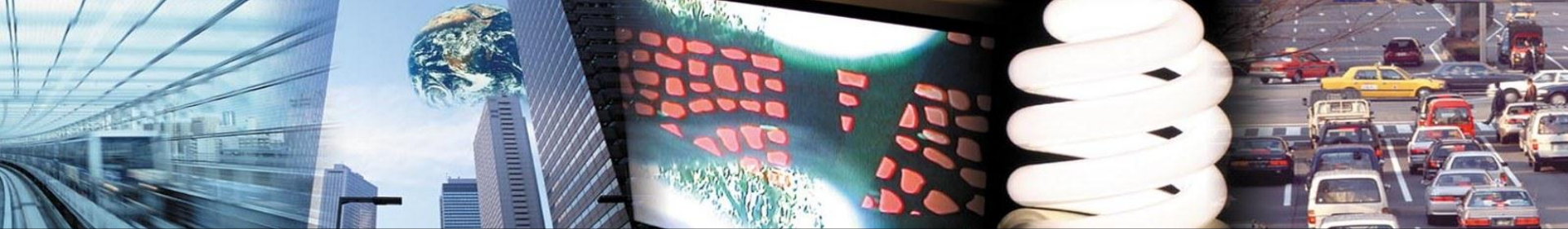


So Latin America's CO₂ Emissions Grow

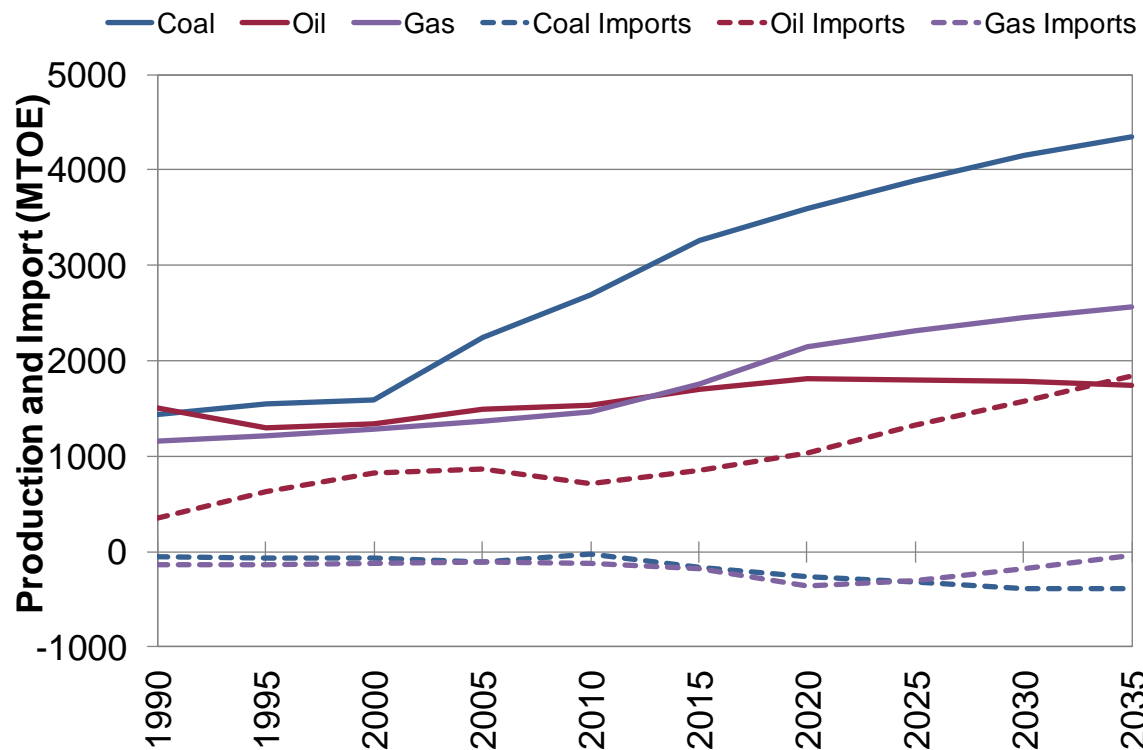


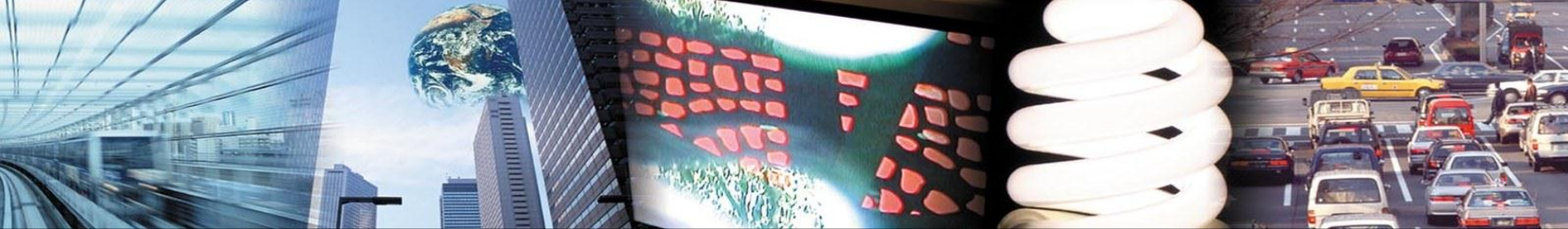


APEC-Wide Concerns

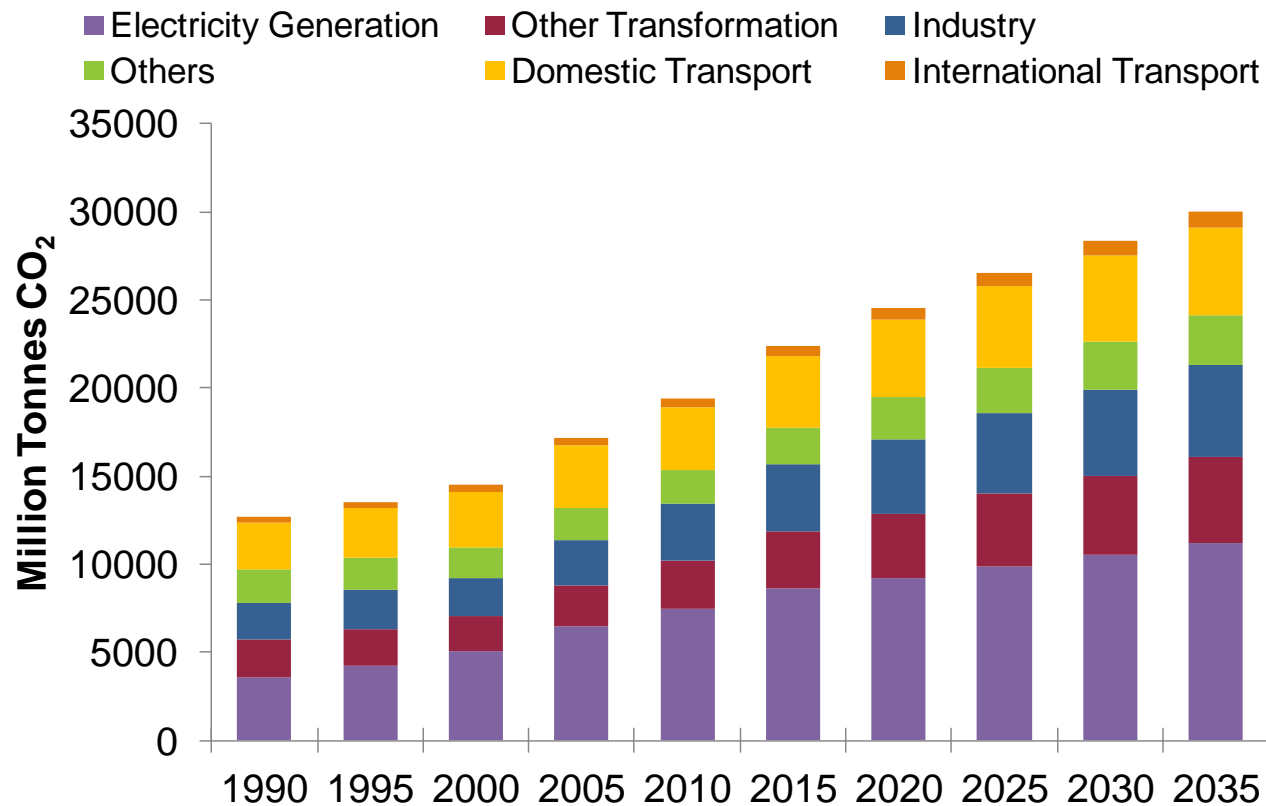


Conclusion #1: Oil Security Remains a Major Threat to the APEC Economies



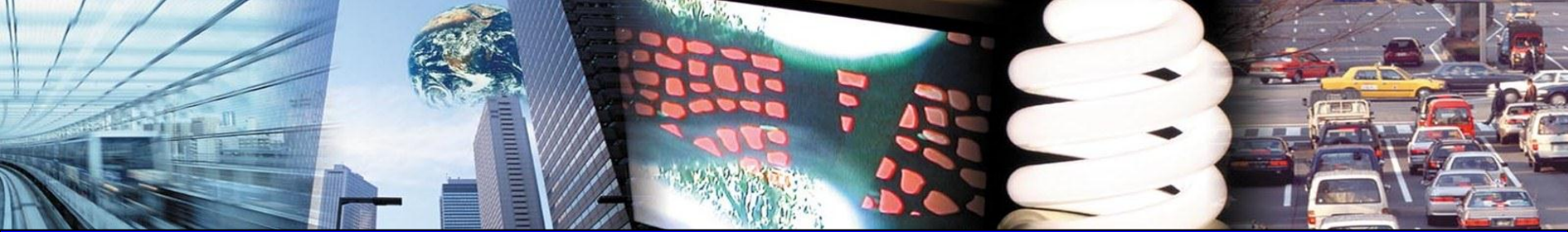


Conclusion #2: Business-As-Usual is Environmentally Unsustainable



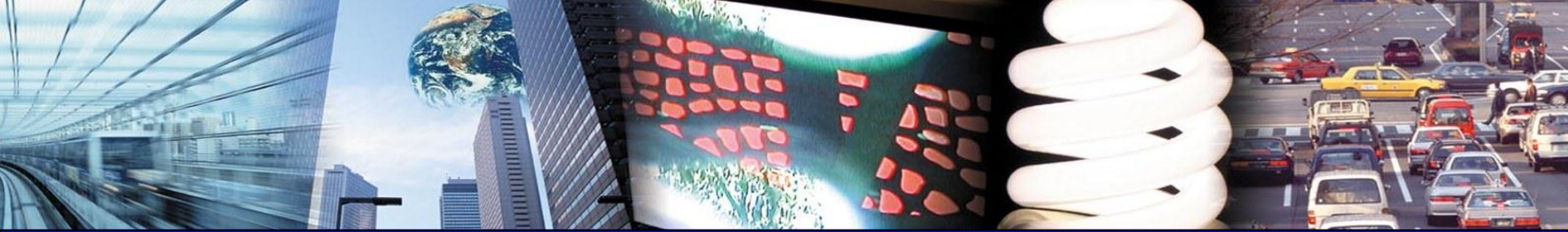


Potential Alternative Cases



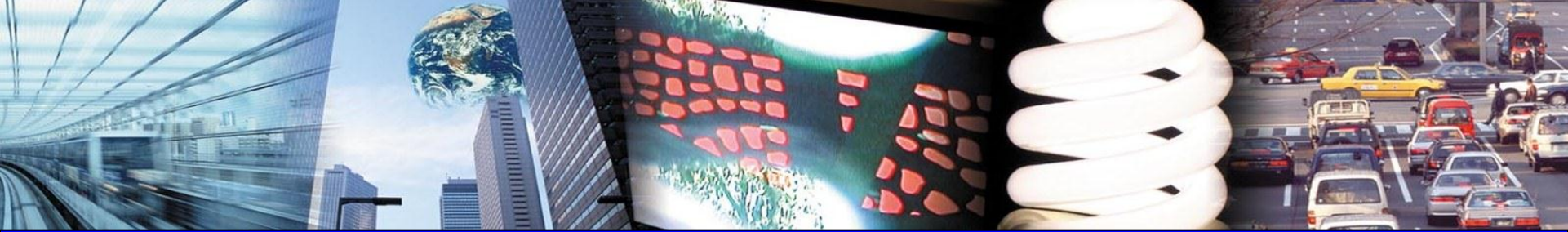
Possible Alternative Case #1: Better City Planning/Compact Cities

- What would be the impact if APEC economies adopted policies
 - limiting ‘urban sprawl’
 - focusing on developing smart/low-carbon cities/towns designed for walking, bicycling, and public transportation?
- APERC has a model capable of dealing with this question, but need better data, especially on vehicle ownership and GDP by city



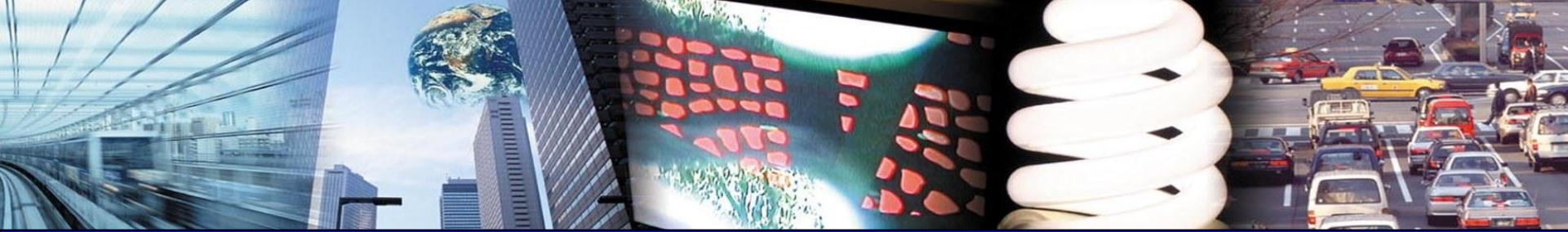
Alternative Case #2: More Efficient Vehicles

- What would be the impact if APEC economies adopted stricter standards for vehicle fuel economy?
- APERC has a model capable of dealing with this question, but need better data on the current composition of the vehicle fleet in each economy
- Variant of this case might look at vehicle R&D priorities; would APEC be better off if next generation vehicles were:
 - Electric and other alternative fuel vehicles; *or*
 - Made of carbon fiber so as to be super-light and super-efficient?



Alternative Case #3: High Gas

- What would happen if the APEC economies could more rapidly develop their gas resources, including unconventional gas?
 - Use the gas to back out coal in electricity generation
 - Thereby reduce greenhouse gas emissions and air pollution
- Potential shale gas resource data available from the US Geological survey for some APEC economies, gap is Southeast Asia; coal bed methane unknown
- Need better resource data, cost data, comparable coal generation costs
- What are the barriers to gas development?



Other Alternative Cases?

- APERC is looking for alternative cases that:
 - Could provide interesting insights
 - Have not been well-examined previously (such as by IEA)
 - Can be done in a very limited time
- We welcome your suggestions and your assistance!



Thank you for your kind attention

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