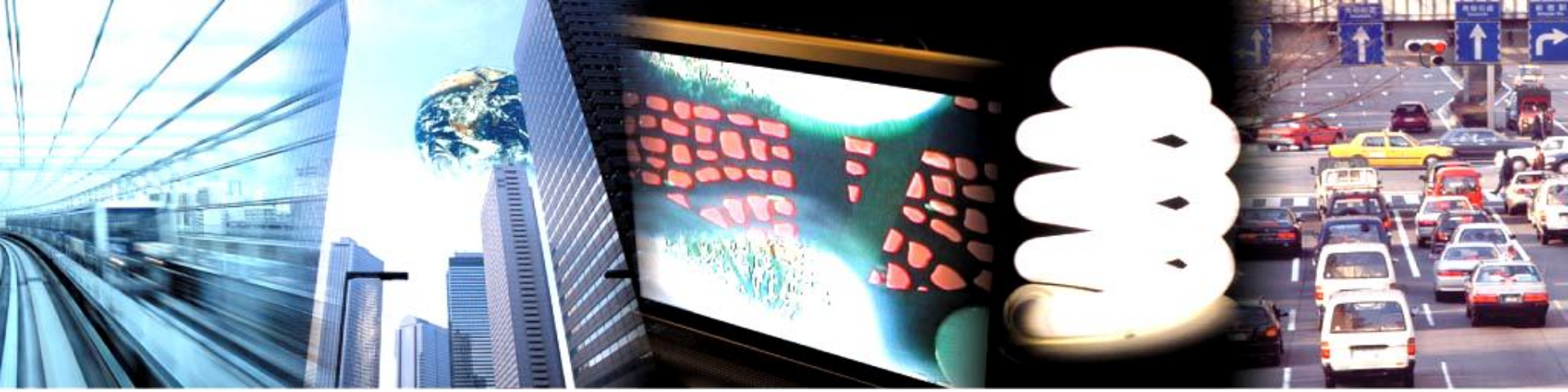

APERC Annual Conference 2013

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High Gas Scenario

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Asia-Pacific Economic Cooperation

What this presentation will show?

The immense size of the gas resources potentially available in the APEC region

An example 'High Gas' modeling scenario illustrating how these resources could benefit the APEC economies

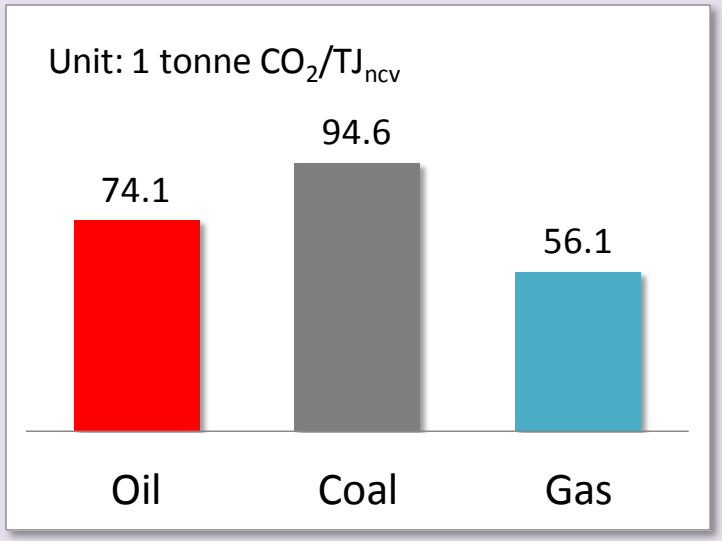
Some steps APEC could be taking to promote increased use of natural gas

APEC Energy Ministers on Natural Gas

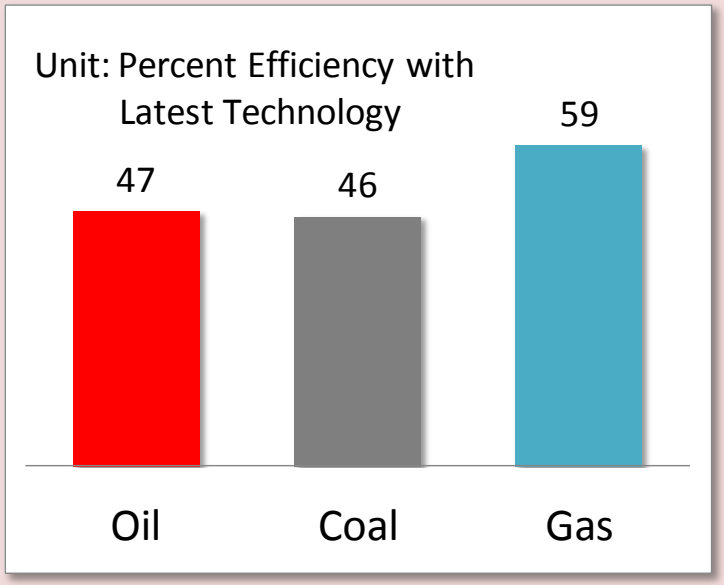
2012 St. Petersburg Declaration - *Energy Security: Challenges and Strategic Choices*

- While the role of new and innovative sources of energy expands, **fossil fuels will continue to play a key role in the APEC energy market.**
- Expanded production and trade of **natural gas**, which has widespread reserves throughout the globe, can ease **the transition to a lower carbon economy**.
- Natural gas is **the cleanest burning fossil fuel** used in energy production.
- It is important to evaluate the **production**, trade potential and environmental impact of **shale gas and other unconventional natural gas resources,** as well as to promote steady investment in natural gas infrastructure, including liquefaction facilities, for increasing energy security and economic growth in the APEC region.

The Environmental Benefits of Gas



Gas combustion **produces less CO_2** per unit of heat



Gas power plants are **more efficient**

- When efficiently burned:
  - ✓Gas produces much **less local air pollution** than coal
  - ✓Gas production is typically **less damaging to land and water resources**
- Gas electricity generation can be rapidly cycled on and off,
  - → **nicely complements wind and solar generation**

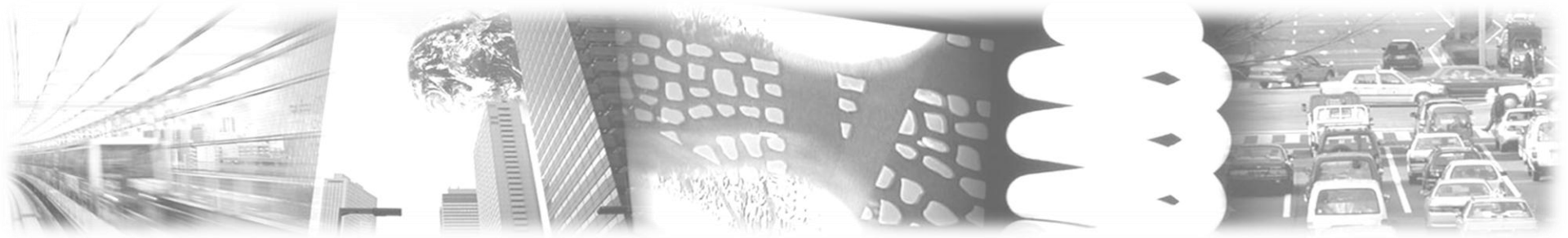
Source: Ecofys Netherlands 2012

Natural Gas Resources

APEC's Technically Recoverable Conventional and Unconventional Gas Resource Base, in Mtoe

Economy	Conventional Gas	Unconventional Gas				Conventional & Unconventional Gas	2009 Production	Years of Production
		Shale Gas	Coal Bed Methane	Tight Gas	Total			
China	5 225	22 150	9 625	na	31 775	37 000	76.7	482
US	30 750	14 475	3 500	13 000	30 975	61 725	532.7	116
Australia	5 700	9 950	10 975	500	21 425	27 125	38.1	712
Canada	8 650	2 250	1 125	4 250	7 625	16 275	147.6	110
Mexico	2 375	7 425	100	na	7 525	9 900	49.1	202
Russia	86 125	1 825	50	na	1 875	88 000	474.9	185

Sources: Conventional Gas :—MIT, The Future of Natural Gas, 2011
Shale Gas :– USEIA, World Shale Gas Resources, 2011
Production:- BP Statistical Review of World Energy 2011



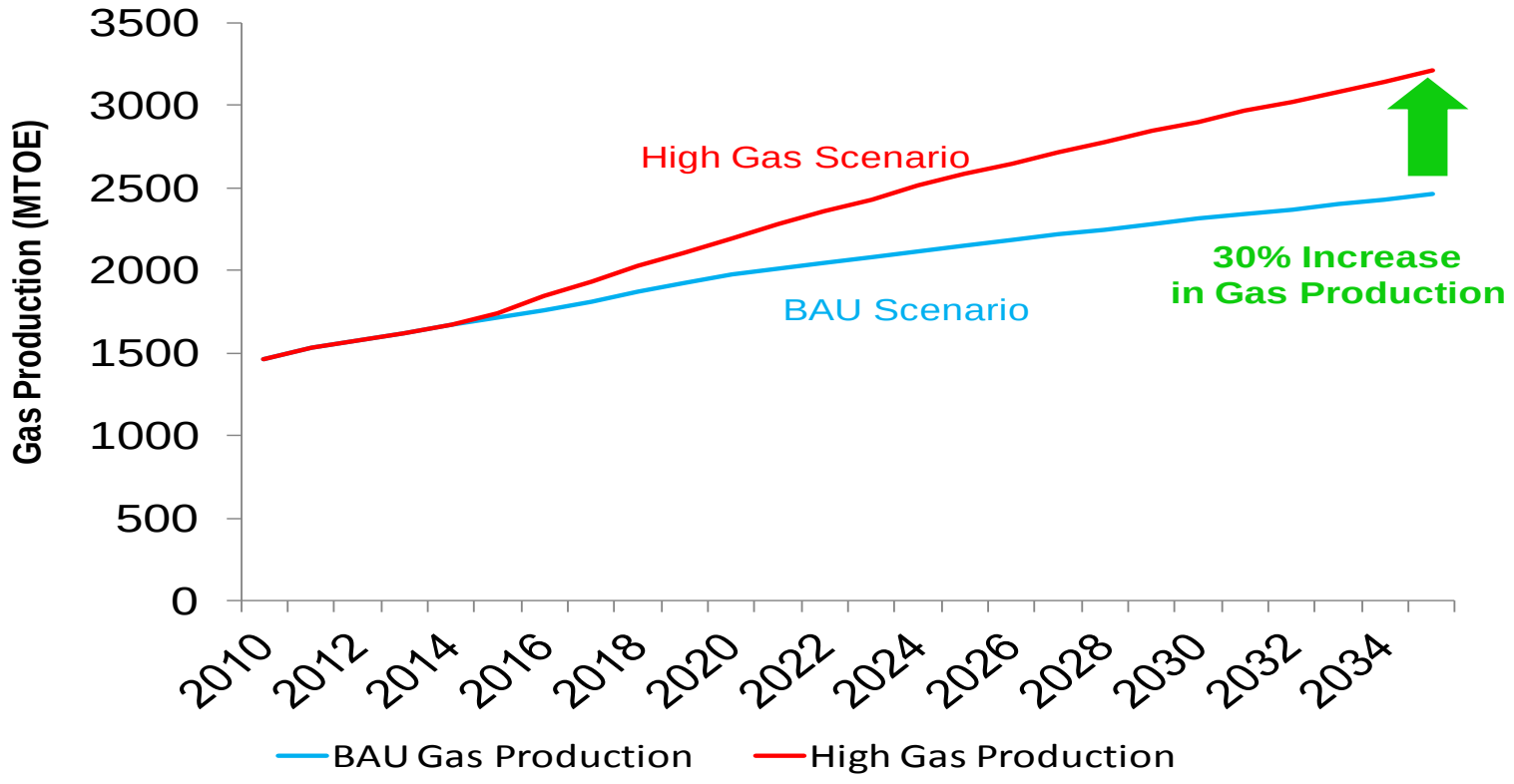
High Gas Scenario

Natural Gas Situations of APEC Economies as of 2010

Some Potential Constraints on Gas Production and Trade

1. Policies requiring a domestic price of gas below market levels (a form of subsidy), thereby limiting the profitability of gas development and making investment in gas development less attractive.
2. Limited technology in some economies for gas development, especially unconventional and deepwater gas development.
3. Policies restricting the export of gas
4. Policies granting a monopoly on gas development to certain domestic firms, or limiting the participation of foreign-owned firms, or otherwise limiting competition in gas development
5. Slow and cumbersome regulatory approvals and land access processes for gas producers

The APEC High Gas Scenario
-Potential Natural Gas Production-



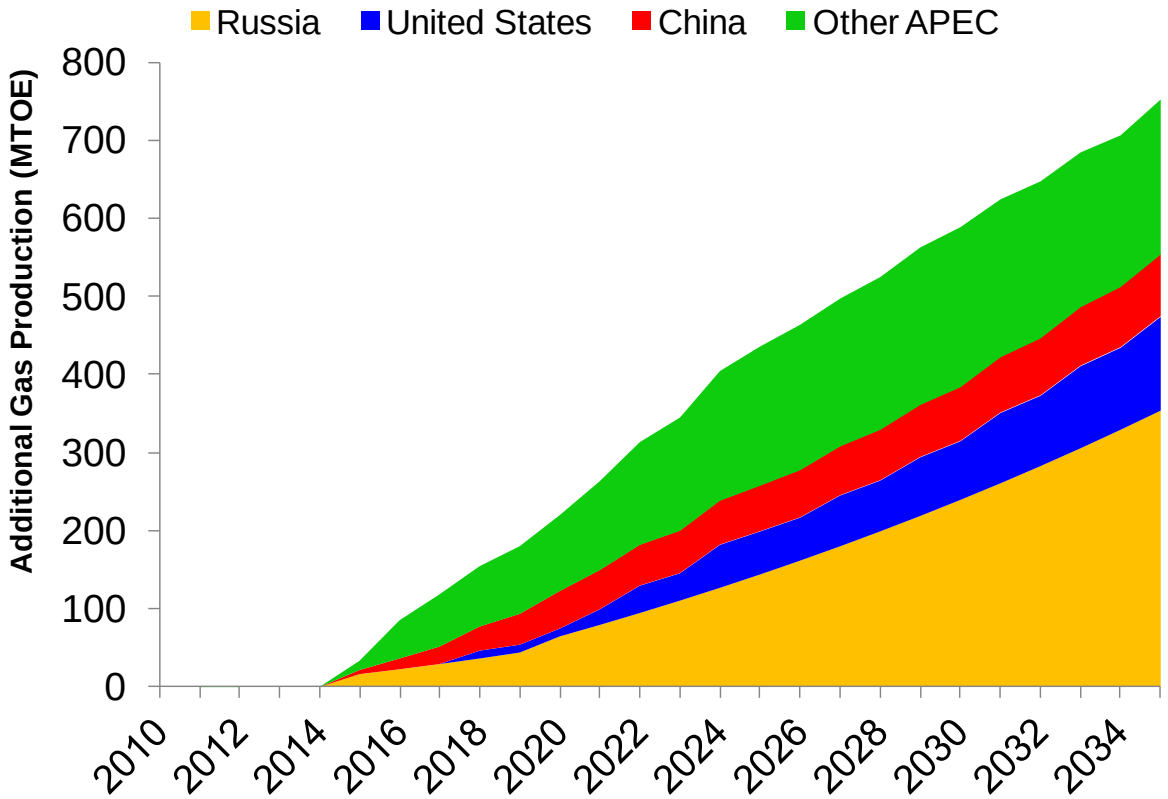
19% of TPES in 2010

25% of TPES in 2035

21% of TPES in 2020

Source: APERC Analysis 2012

Sources of Additional Gas Production for High Gas Scenario

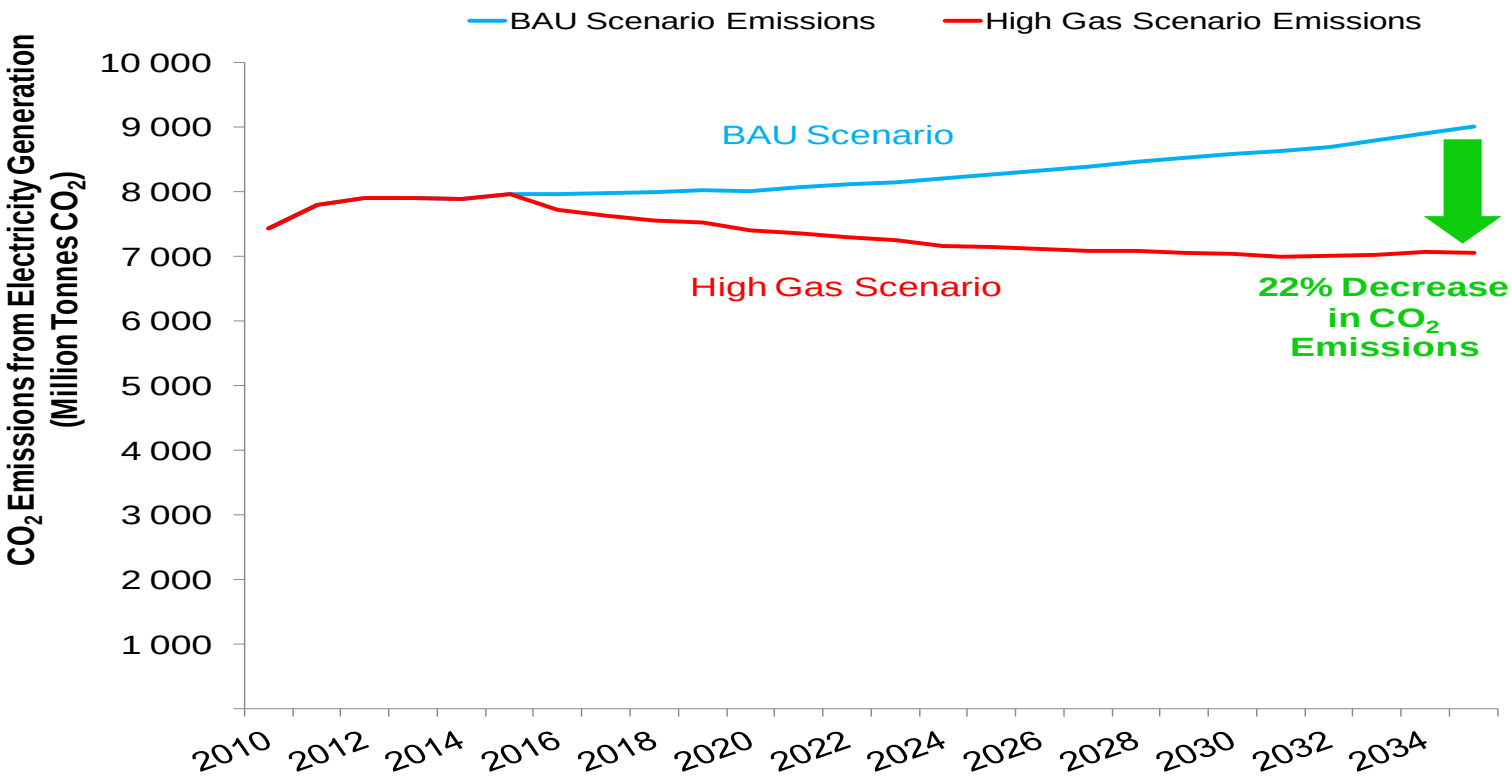


* Note that gas imports from outside APEC region are not considered

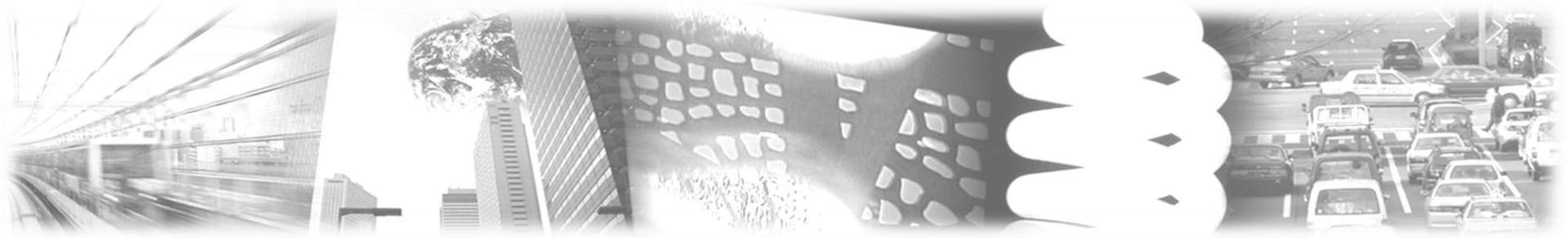
Source: APERC Analysis 2012

Impact on Electricity Sector CO_2 Emissions

Key Assumption: All additional gas is used to **replace coal** in electricity generation → Environmental benefits



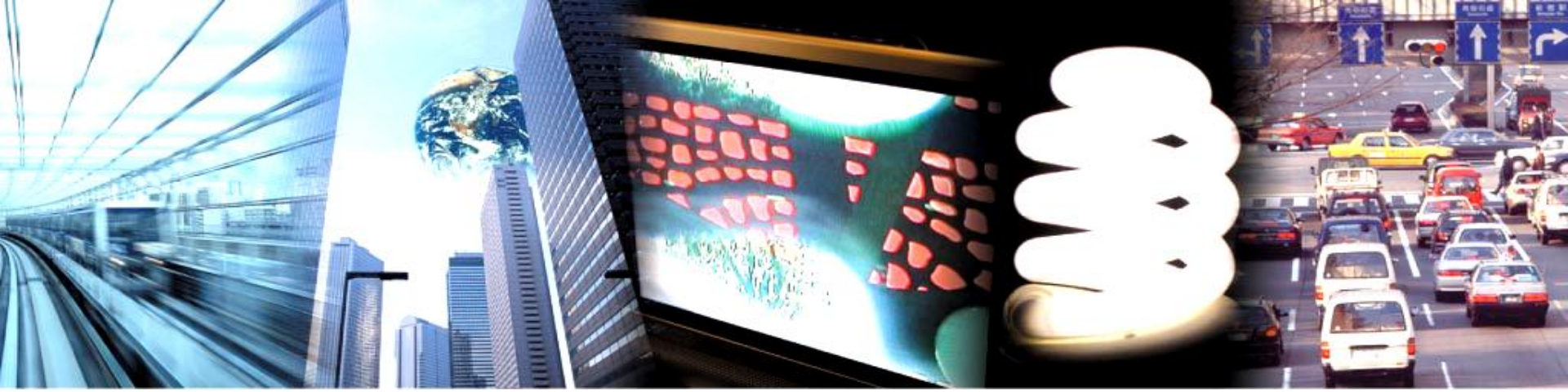
Source: APERC Analysis 2012



Conclusions

How Can APEC Help Promote the Use of Gas?

1. Continue to encourage member economies to rationalise and phase out fossil fuel subsidies in accord with APEC Leaders' Declarations; these subsidies can discourage gas development especially when they take the form of price controls on gas producers
2. Include goods and services for gas industry development in the definition of 'environmental goods and services', and continue to encourage member economies to reduce existing barriers and refrain from introducing new barriers to trade and investment in environmental goods and services
3. Encourage member economies to reform policies that discourage the export of gas
4. Cooperate to promoting best practices in gas industry regulation (safety, environmental protection, economics)



Thank you for your kind attention

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