

Gas Markets in Asia

Current situation, prospects and challenges

CEDIGAZ

Armelle Lecarpentier

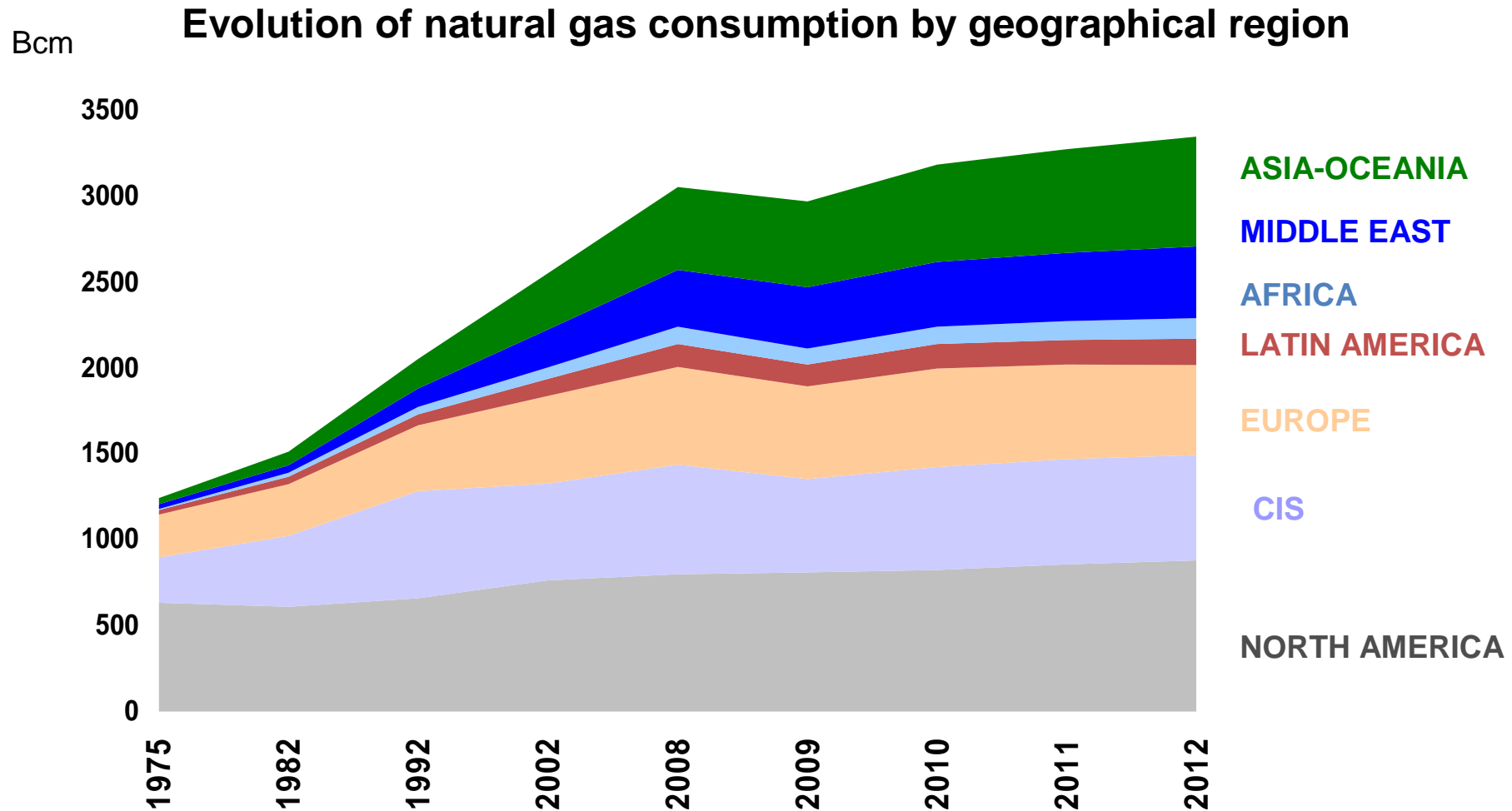
Chief Economist



Trends and features of the Asian market



A relatively young market

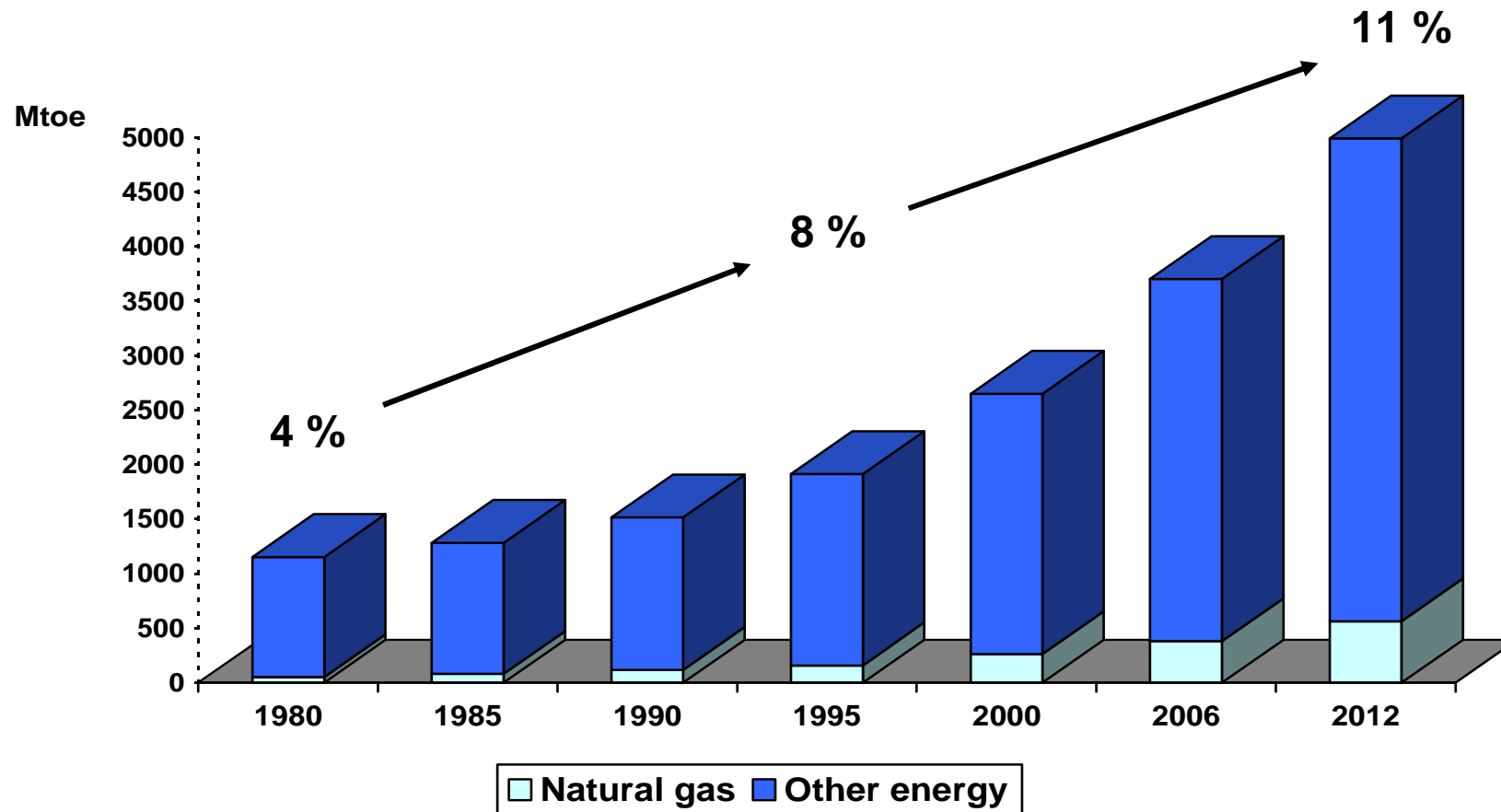


Source: CEDIGAZ Statistical Database



A strong potential for future growth

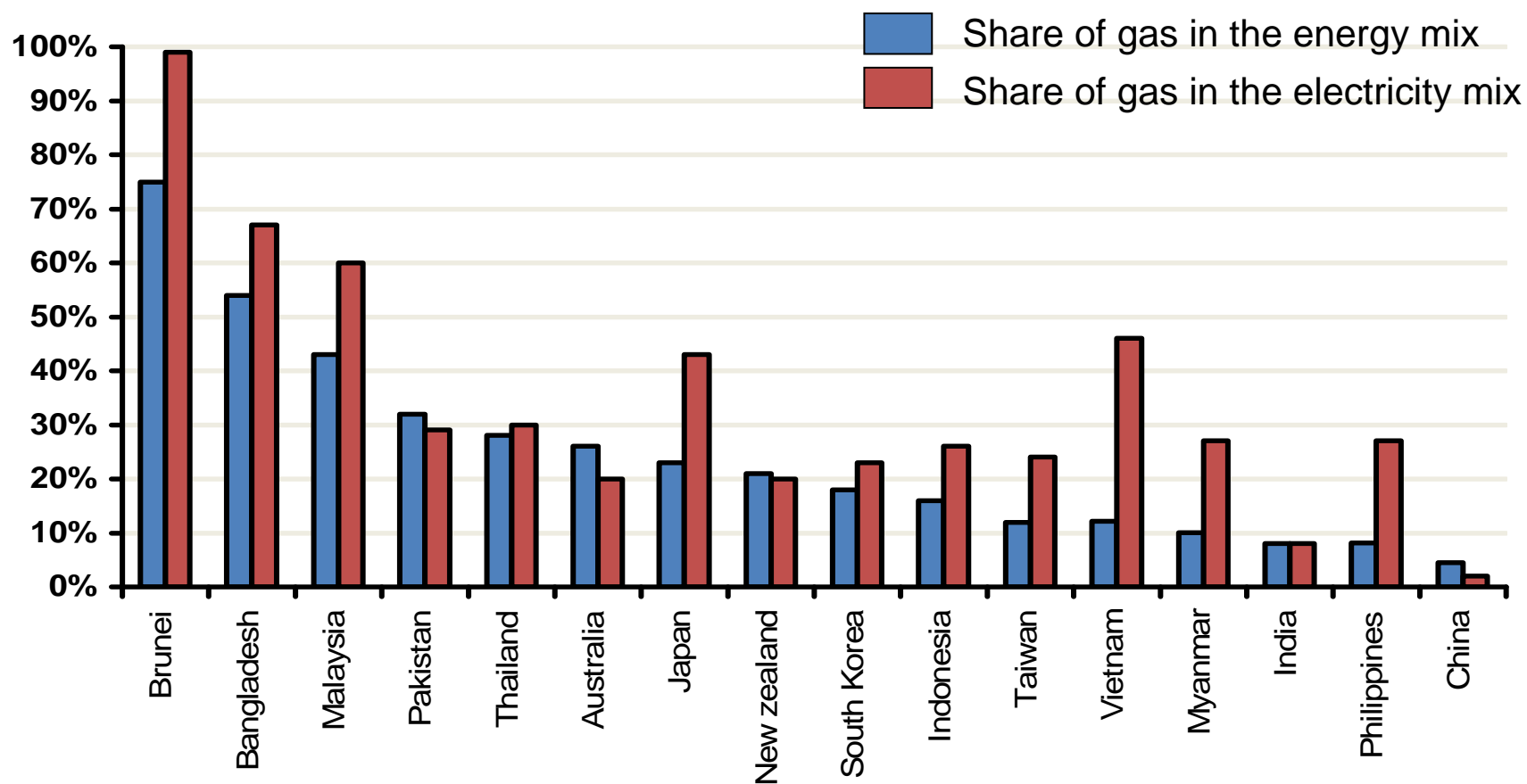
Evolution of the natural gas share in the energy mix of Asia-Oceania



World average: 22 %



Heterogeneous gas markets within the region

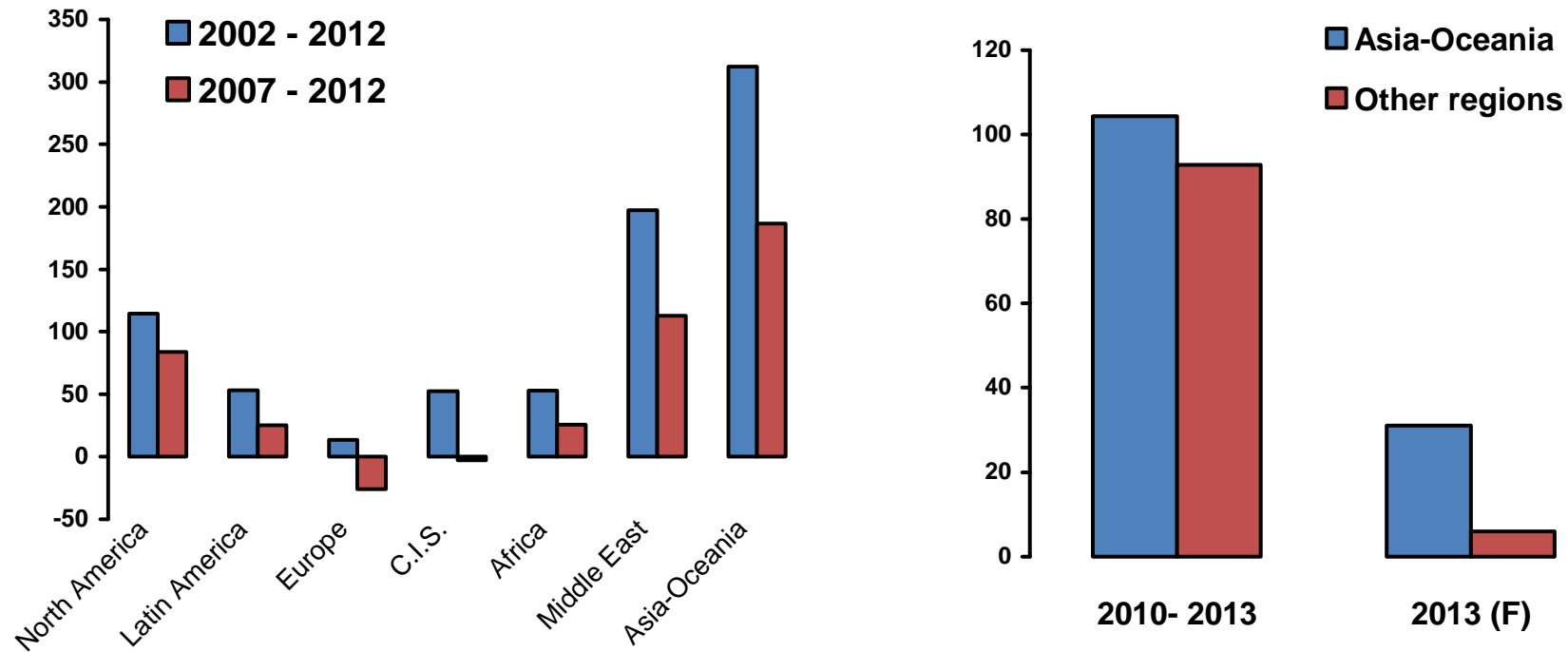


Source: CEDIGAZ analysis from various sources



The main driver of world gas expansion

Volumetric growth in natural gas demand (Bcm)



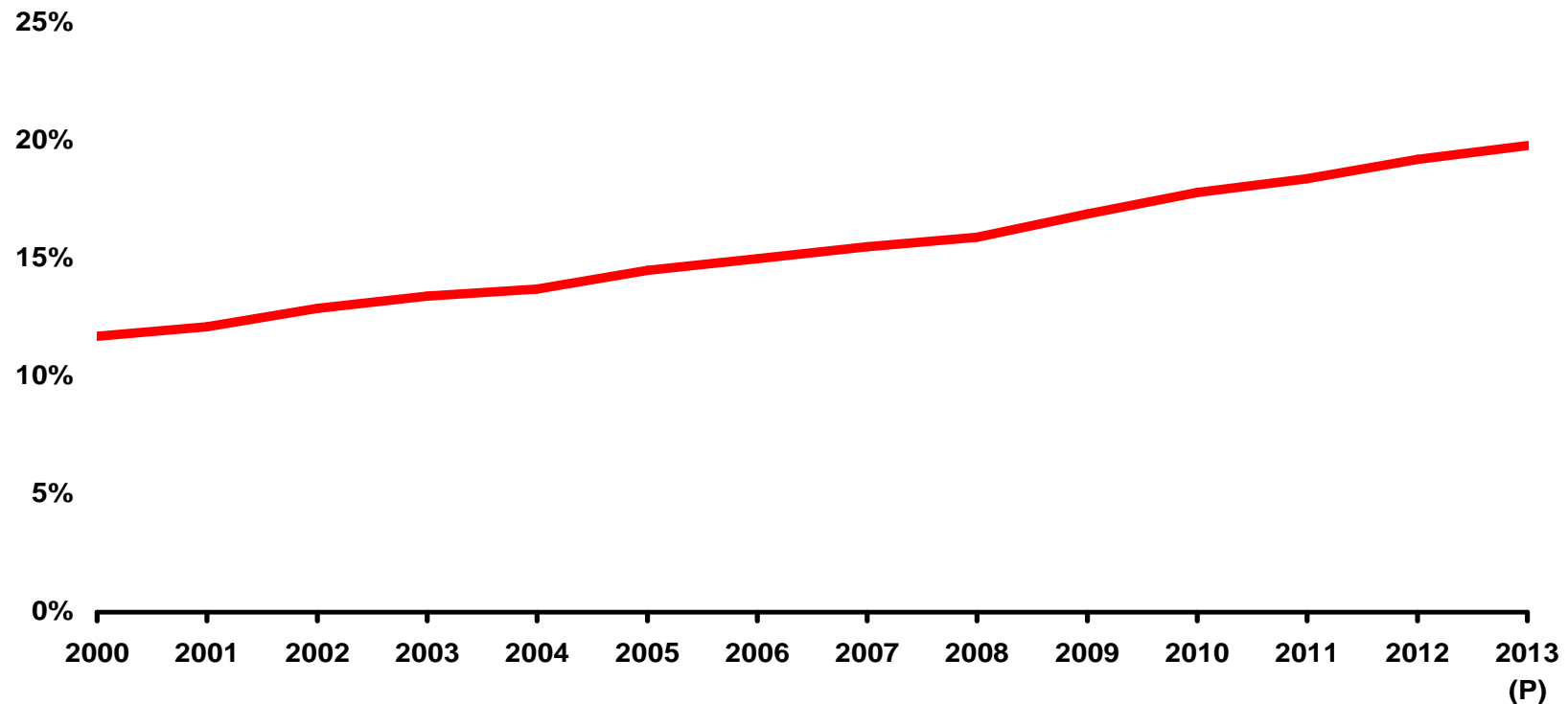
- In 2013, world gas supply and demand are predicted to grow slightly by more than 1%
- With a demand up 5 %, Asia-Oceania is the main contributor to the annual growth

Source: CEDIGAZ



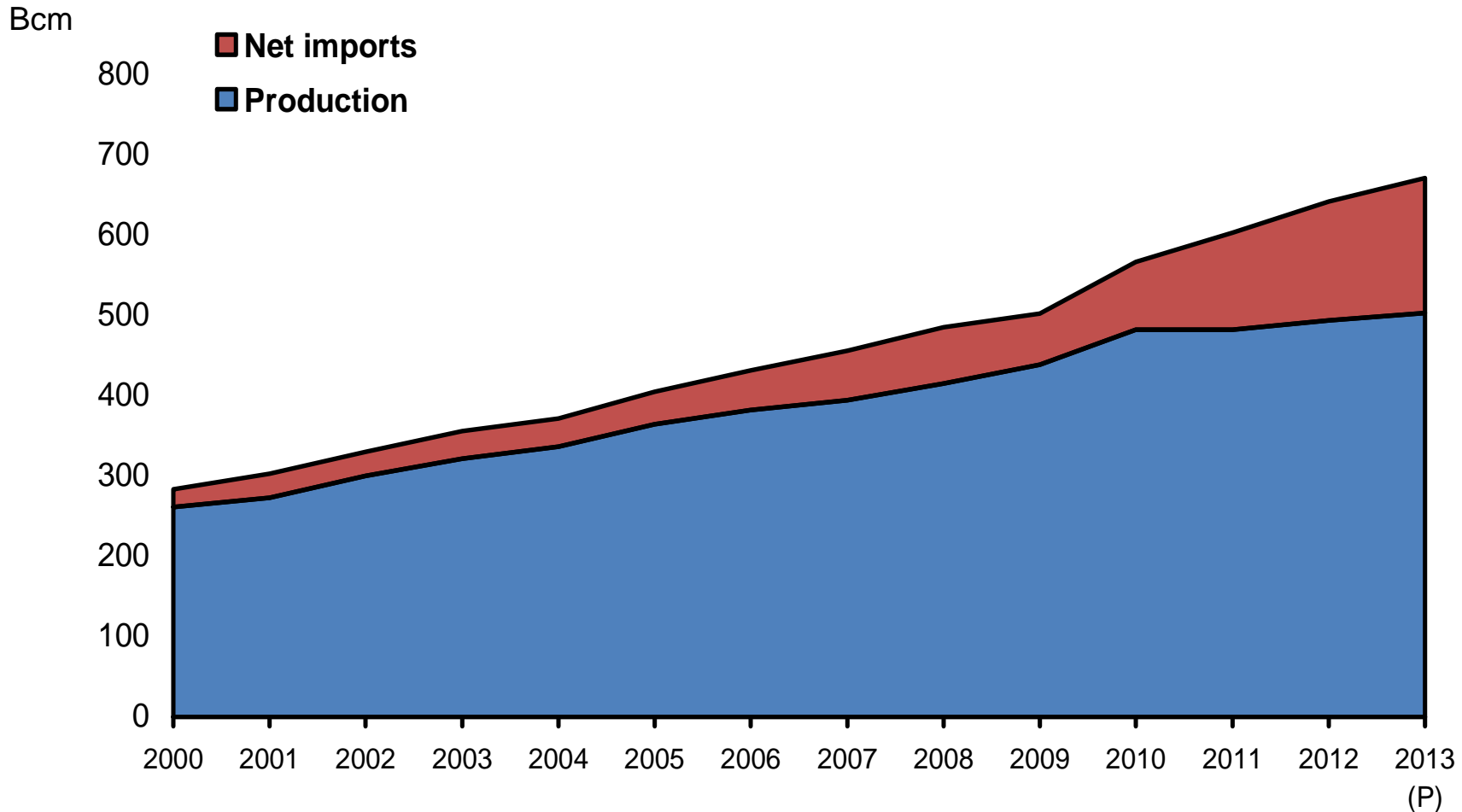
A tremendous inroad in the market

%share of Asia-Oceania in world gas consumption



- **2011:** overtook Europe to become the 3rd largest regional market
- **2012:** overtook the CIS to become the 2nd largest market after North America

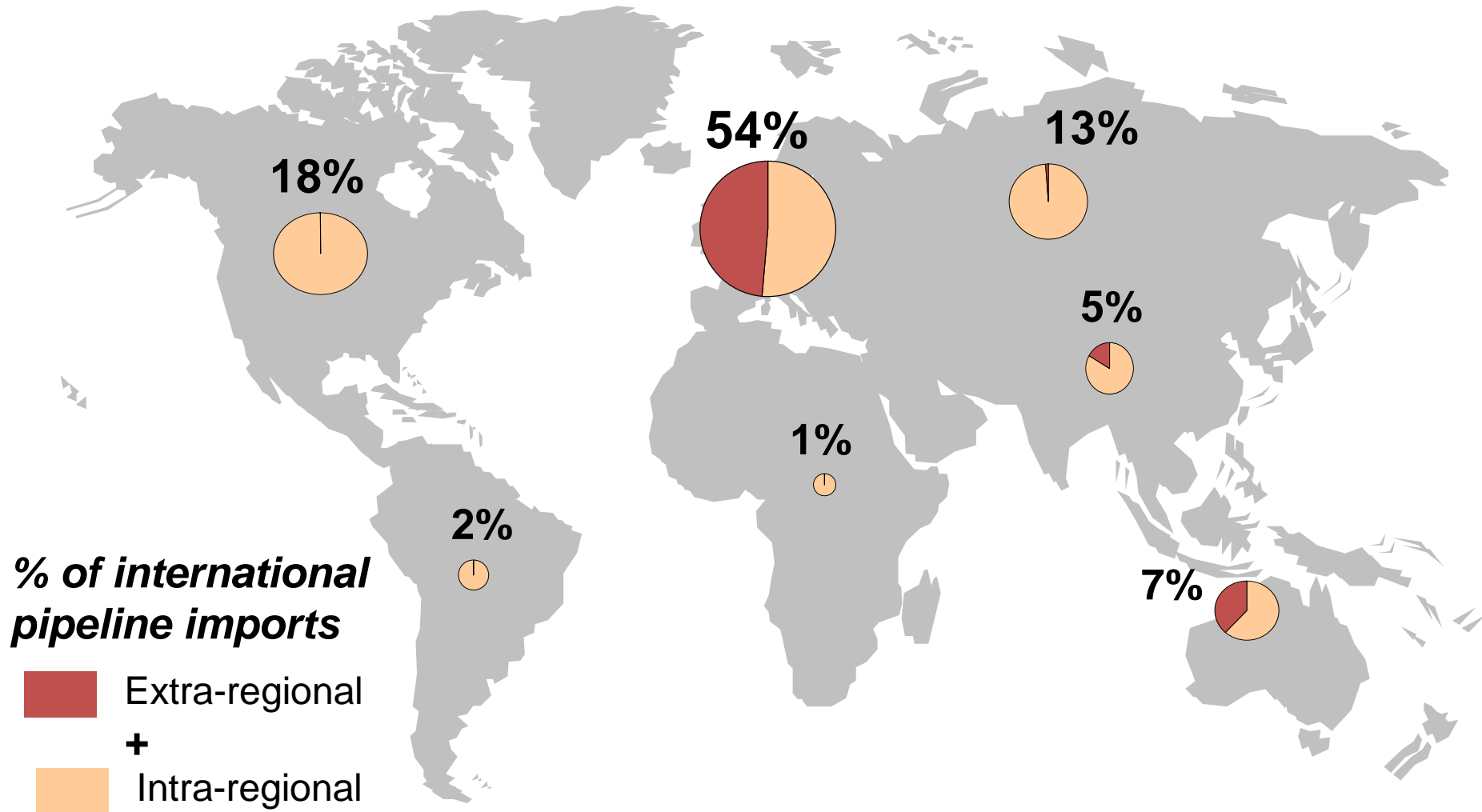
A fast-growing dependence on extra-regional sources amid supply constraints



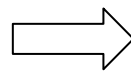
Source: CEDIGAZ Statistical Database



A lack of infrastructures



Source: CEDIGAZ

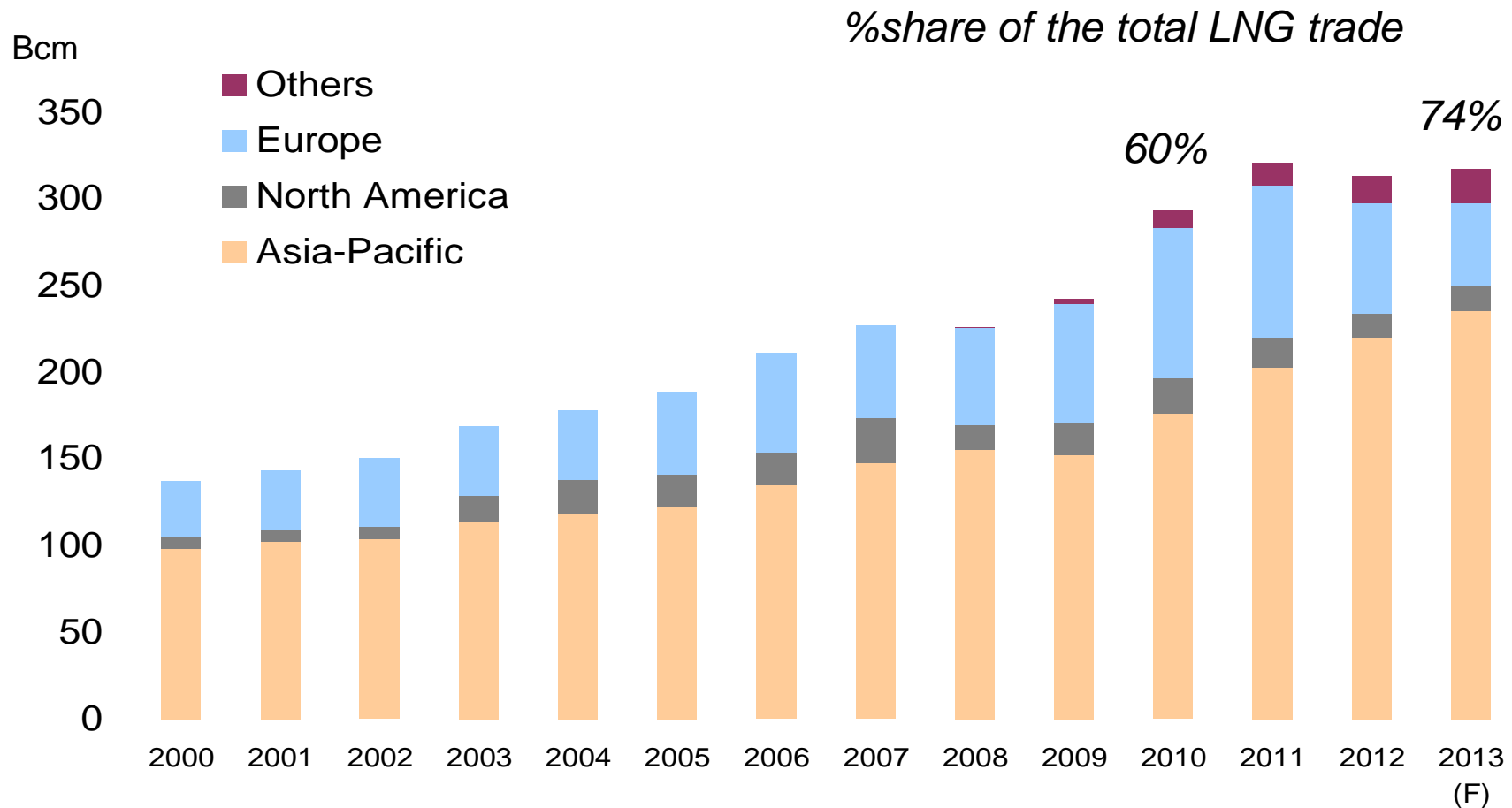


Growing LNG import requirements



A growing leadership on the LNG market

Evolution of international LNG imports



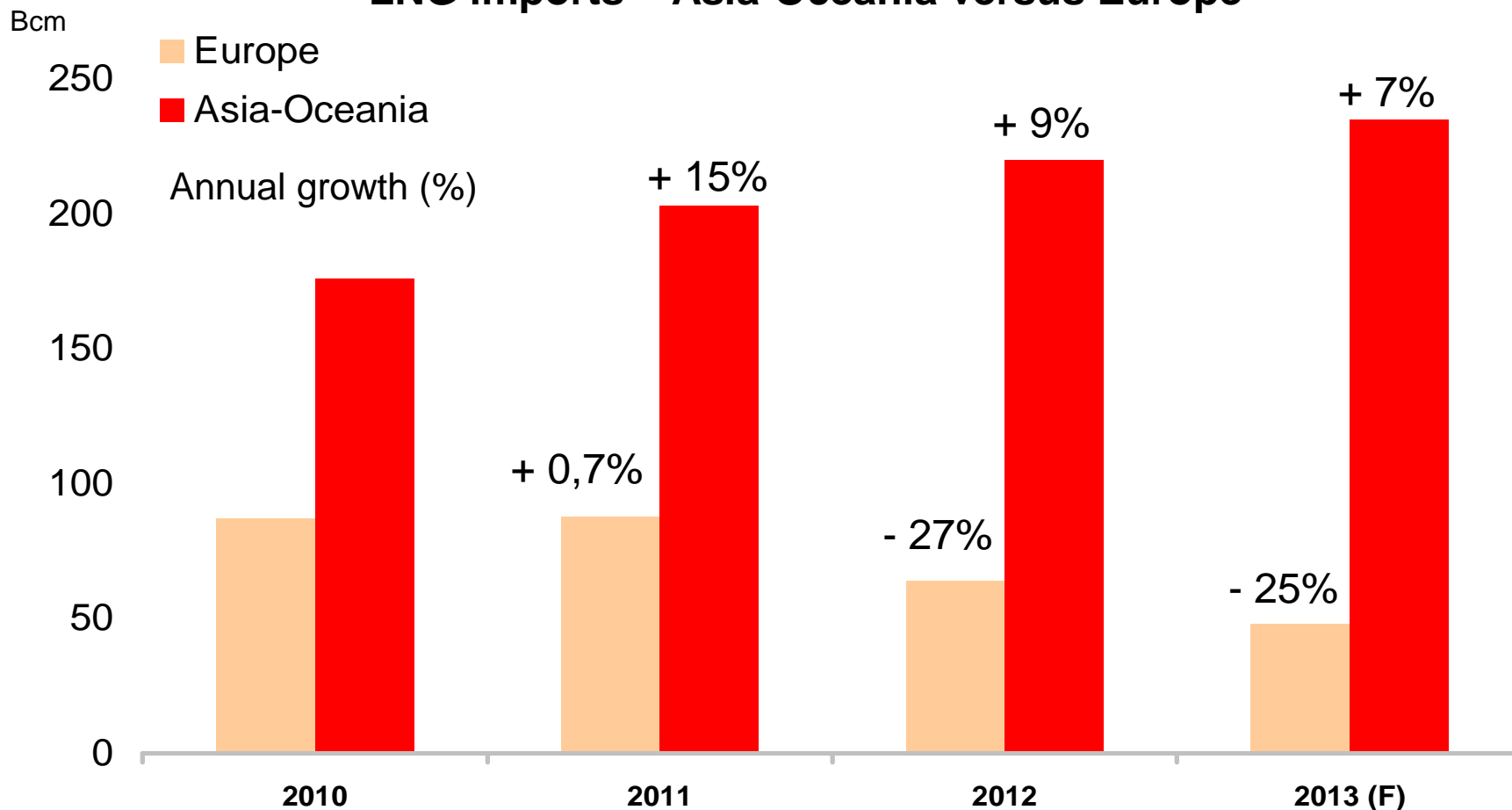
Source: CEDIGAZ Statistical Database



Asia to pull on Europe's LNG supplies

The world LNG trade could at best return to a slight growth in 2013, driven by Asia

LNG imports – Asia-Oceania versus Europe



Source: CEDIGAZ



Prospects for gas supply-demand balance in Asia-Oceania

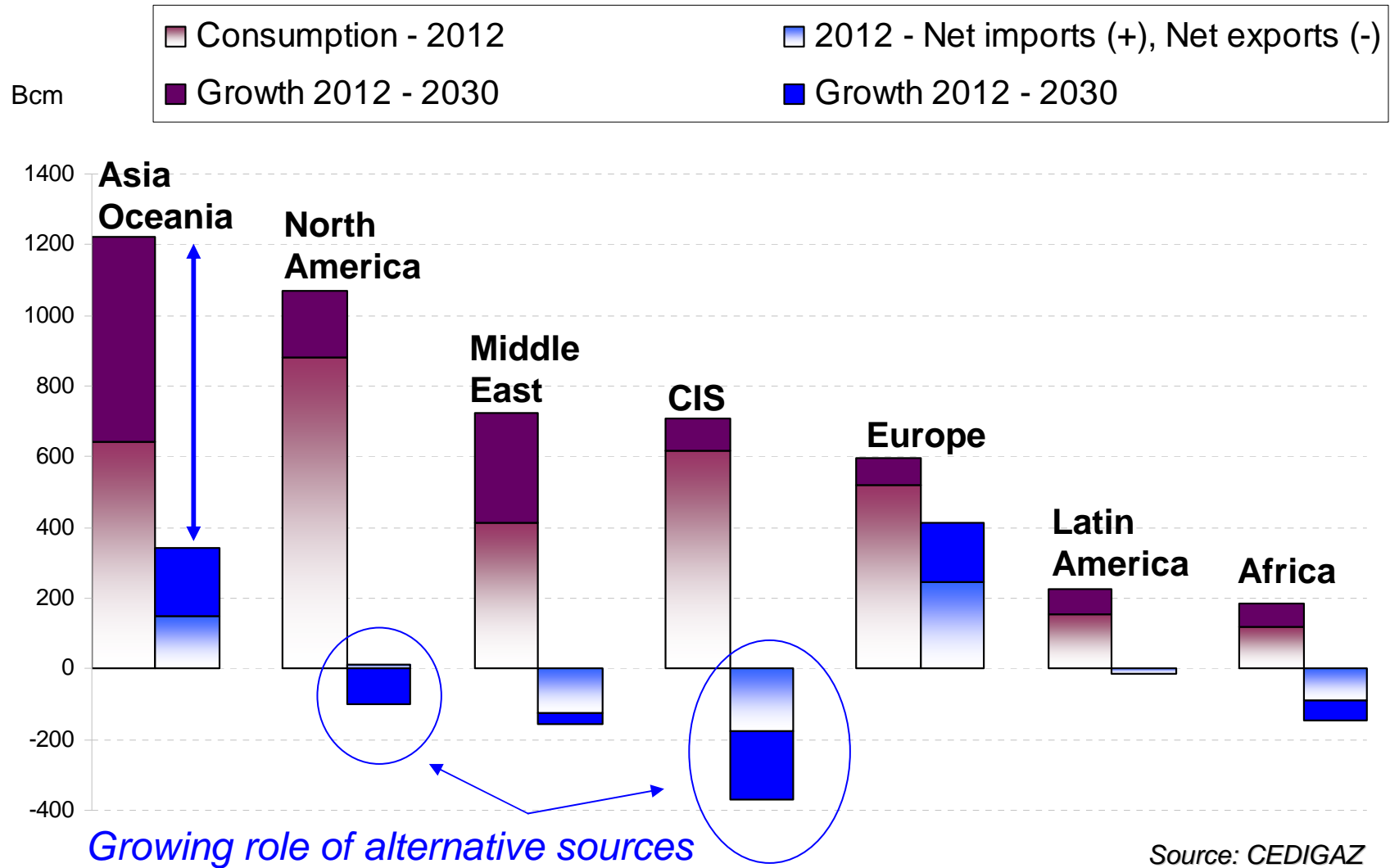


Many drivers for growth

- Economic and demographic growth and the attendant increase in energy demand in a context of industrialization
- Economic growth in Asian emerging markets is forecast at 6.5%/year over 2012-2020 (5%/year in Southeast Asia)
- Cost-effectiveness of gas in power generation relative to oil
- Environmental advantages of gas
- Gas as a fuel of choice in power generation (Southeast Asia)
- Uncertainties on the future role of nuclear (Northeast Asia)
- Urbanization and city expansion (China, South Korea) in line with the development of the network
- Political support for a diversification of the energy mix and a growing role of gas (transport) in the context of the energy transition



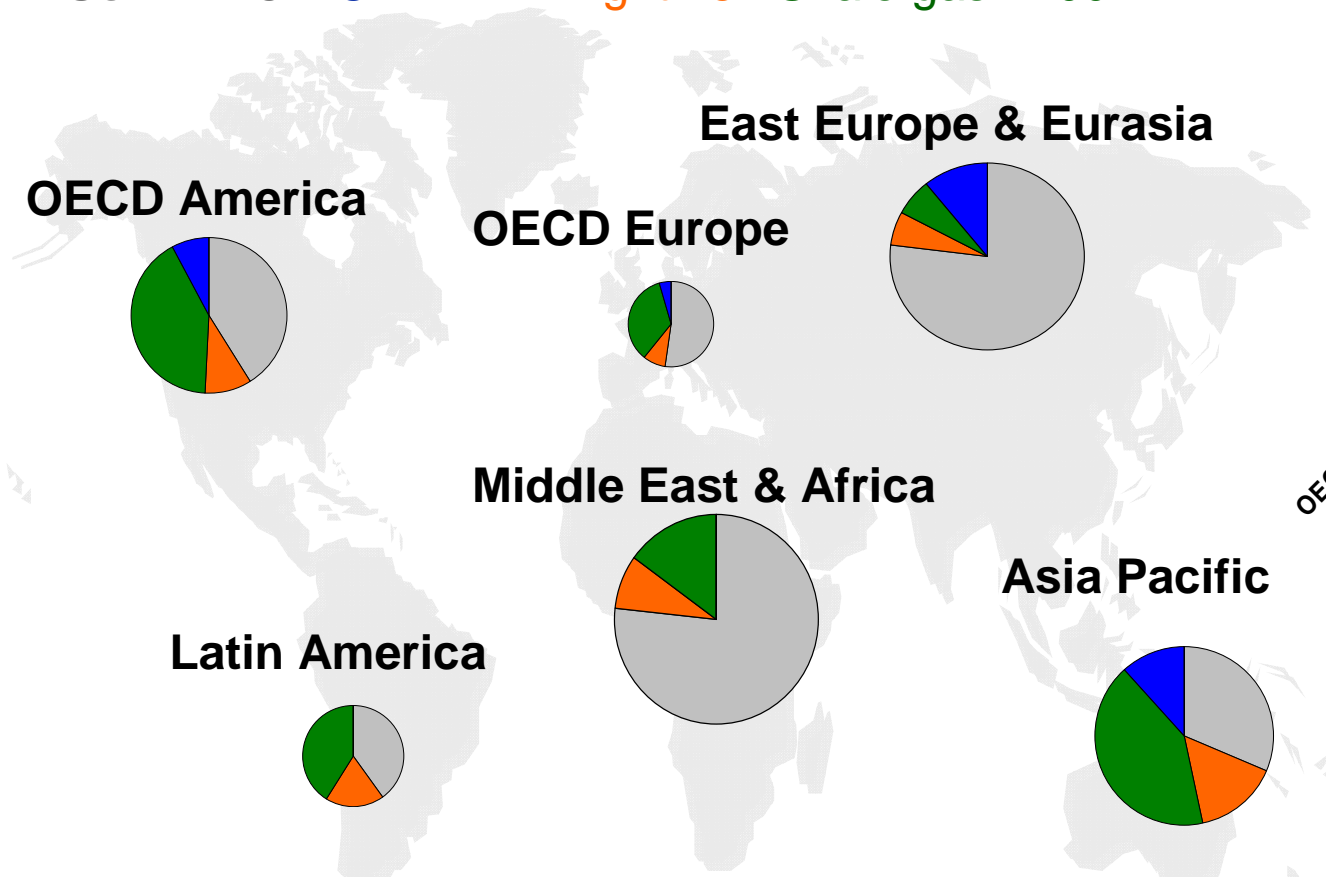
A growing impact on the international market



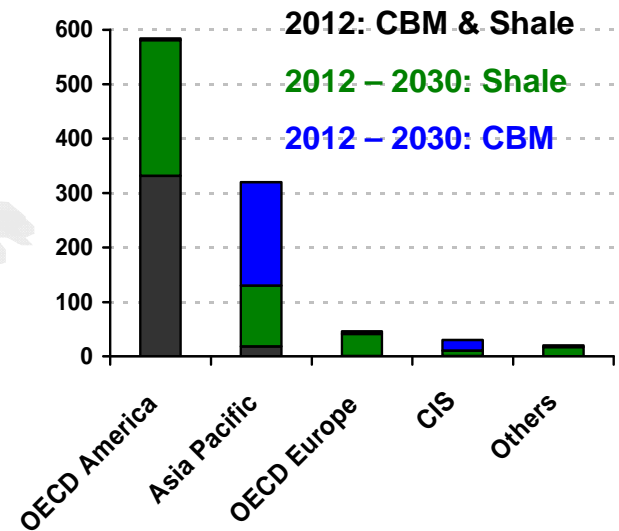
Unconventional gas issues and uncertainties

Recoverable resources (Tm3)

Conv. : 462 CBM : 47 Tight : 81 Shale gas : 200



Production prospects



Source: CEDIGAZ

Notes: Remaining resources comprise proven reserves, reserves growth and undiscovered resources.

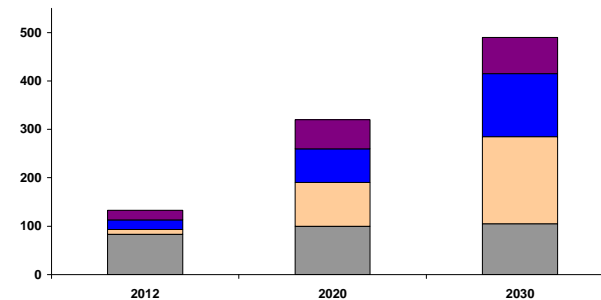
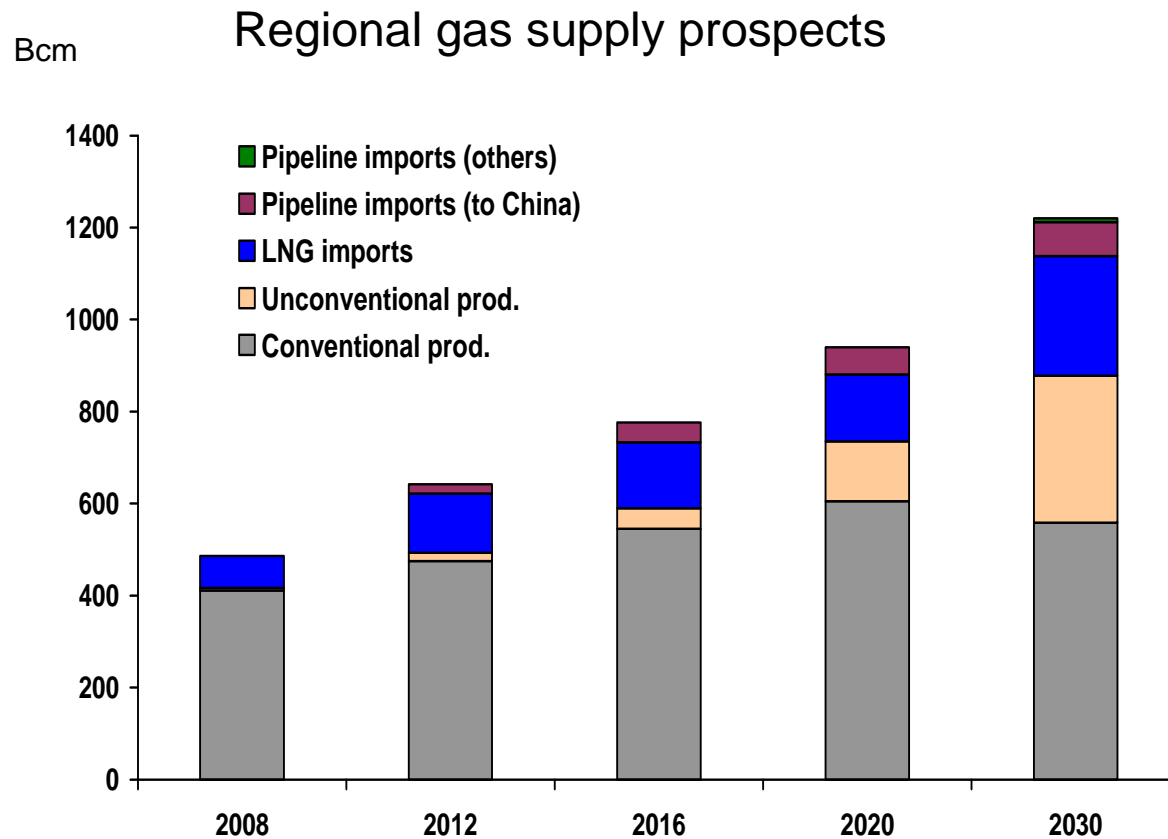
Source: International Energy Agency (WEO 2012) based on BGR (2011), US DOE/EIA (2012), USGS, IEA databases and analysis.



Prospects for gas supply in Asia-Oceania

A current acute and growing gas shortage

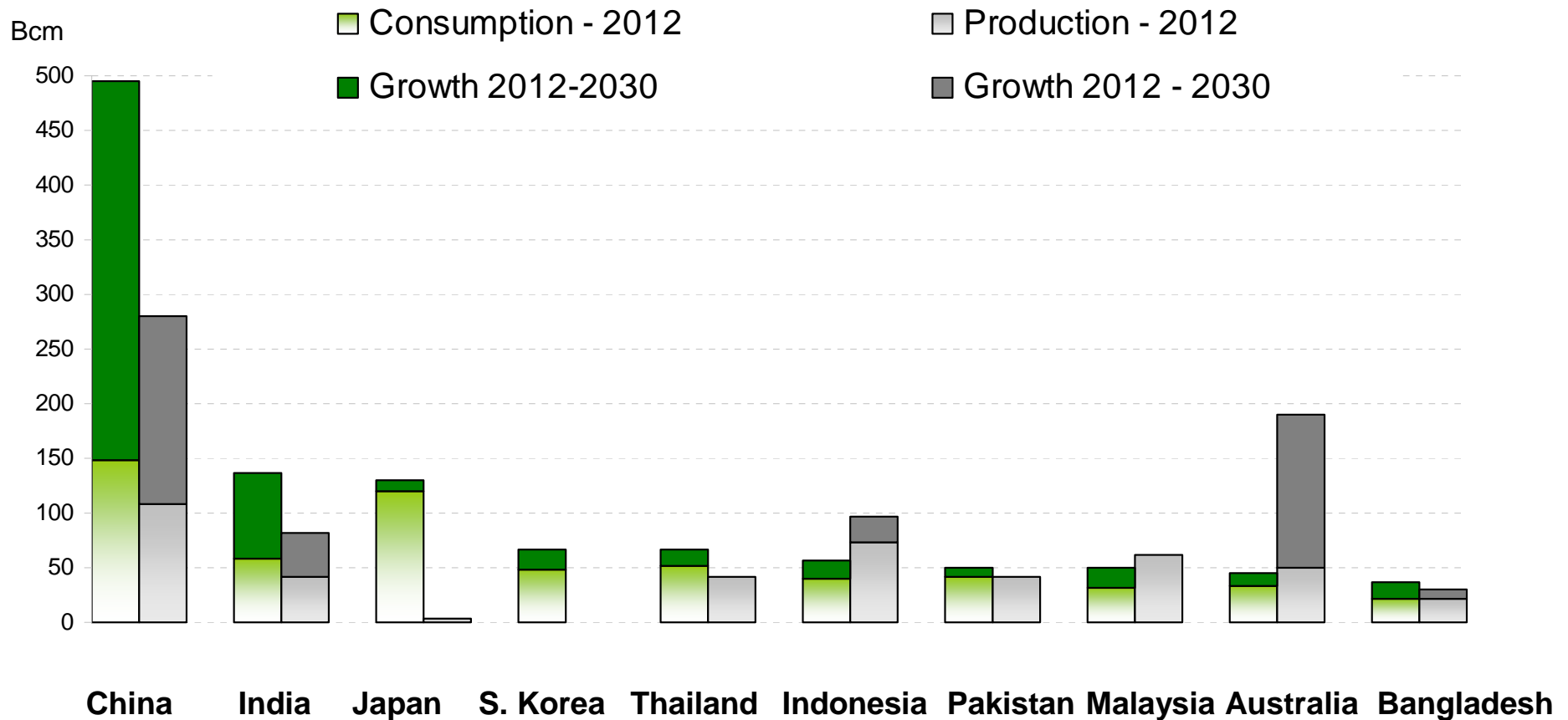
CHINA



Source: CEDIGAZ



National supply-demand perspectives

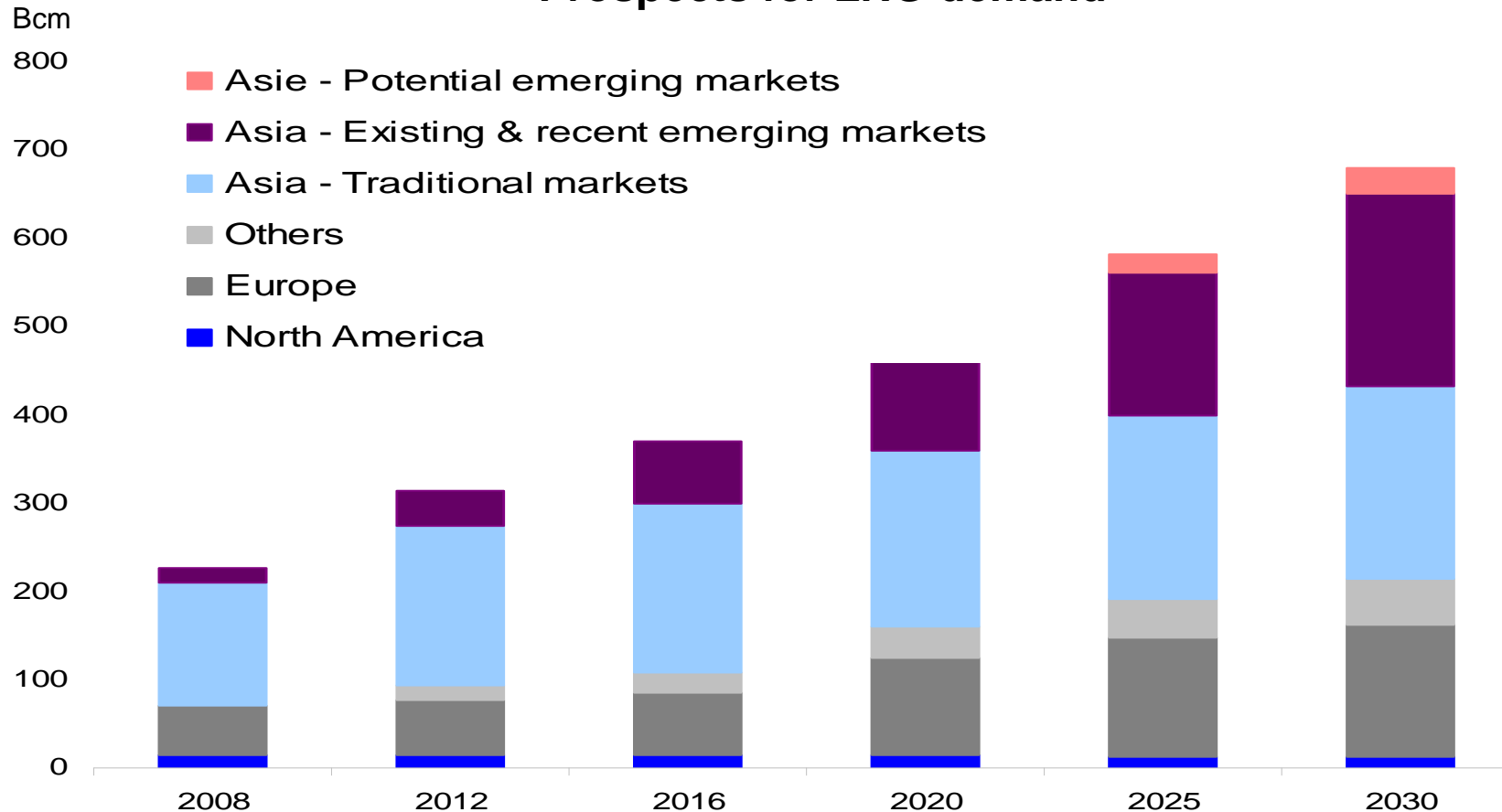


Source: CEDIGAZ



The key market for LNG

Prospects for LNG demand



Traditional markets : Japan, South Korea and Taiwan.

Existing & recent emerging markets: India, China, Thailand, Singapore, Indonesia and Malaysia.

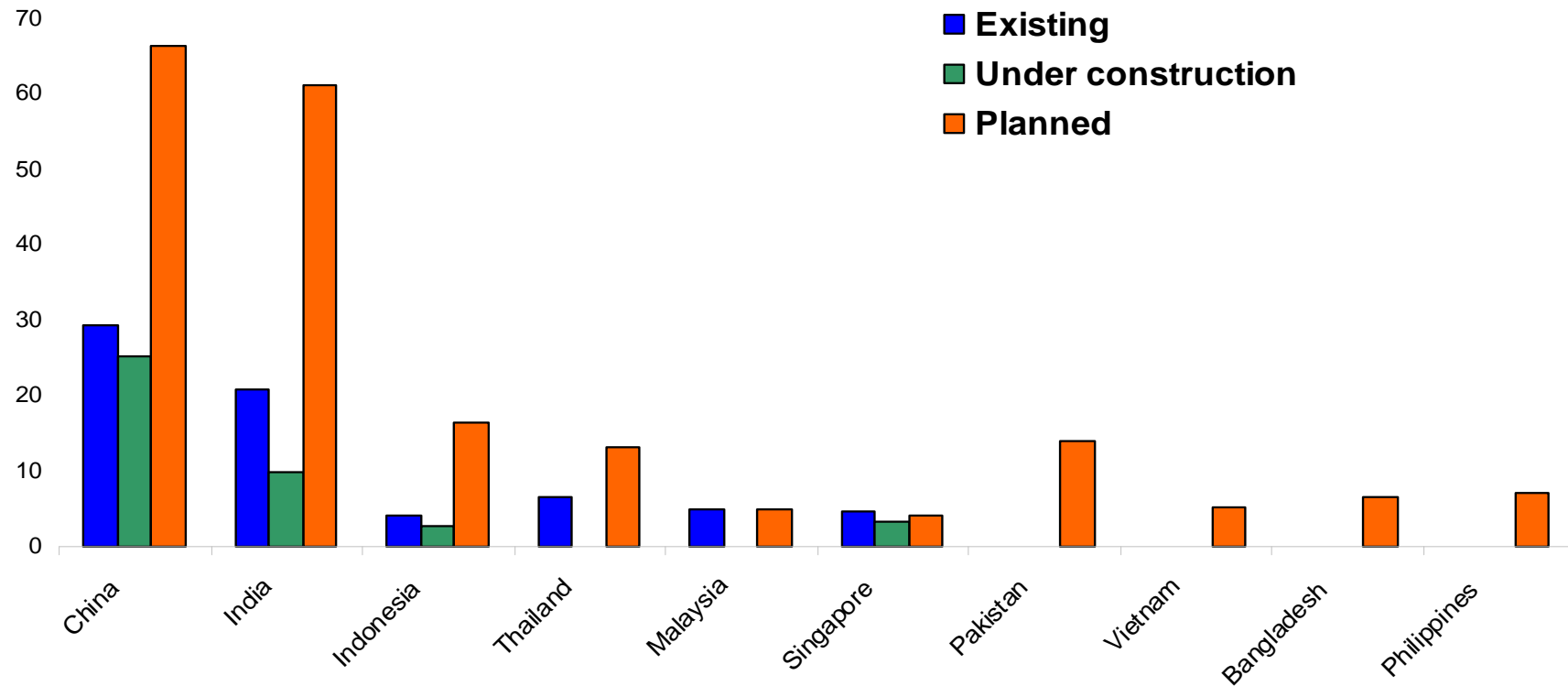
Potential emerging markets: Vietnam, Bangladesh, Myanmar, Philippines and Pakistan.

Source: CEDIGAZ



A flurry of regasification projects

Nominal regasification capacity by project status (as of 1 June 2013)
(Bcm/year)



The most realistic import option in the short and medium-term in some countries ...

Source: CEDIGAZ



The development of floating regasification and floating liquefaction



- Fifteen FSRUs operating today, and more than a dozen projects worldwide
- Floating regas can be quicker, cheaper and easier to permit than conventional onshore projects
- Indonesia and Malaysia, traditional LNG exporters, have chosen FSRU to import LNG

In parallel with the development of FSRU, the development of floating LNG is becoming increasingly apparent with some projects approaching fruition

- Several FLNG projects in Asia Oceania, of which two under construction (Shell's Prelude LNG in Australia, Petronas FLNG1 in Malaysia)
- The advantages of this technology in terms of cost control and quicker construction time remain to be proved
- Two FLNG projects in Malaysia targeted at supplying domestic needs

Challenges and uncertainties



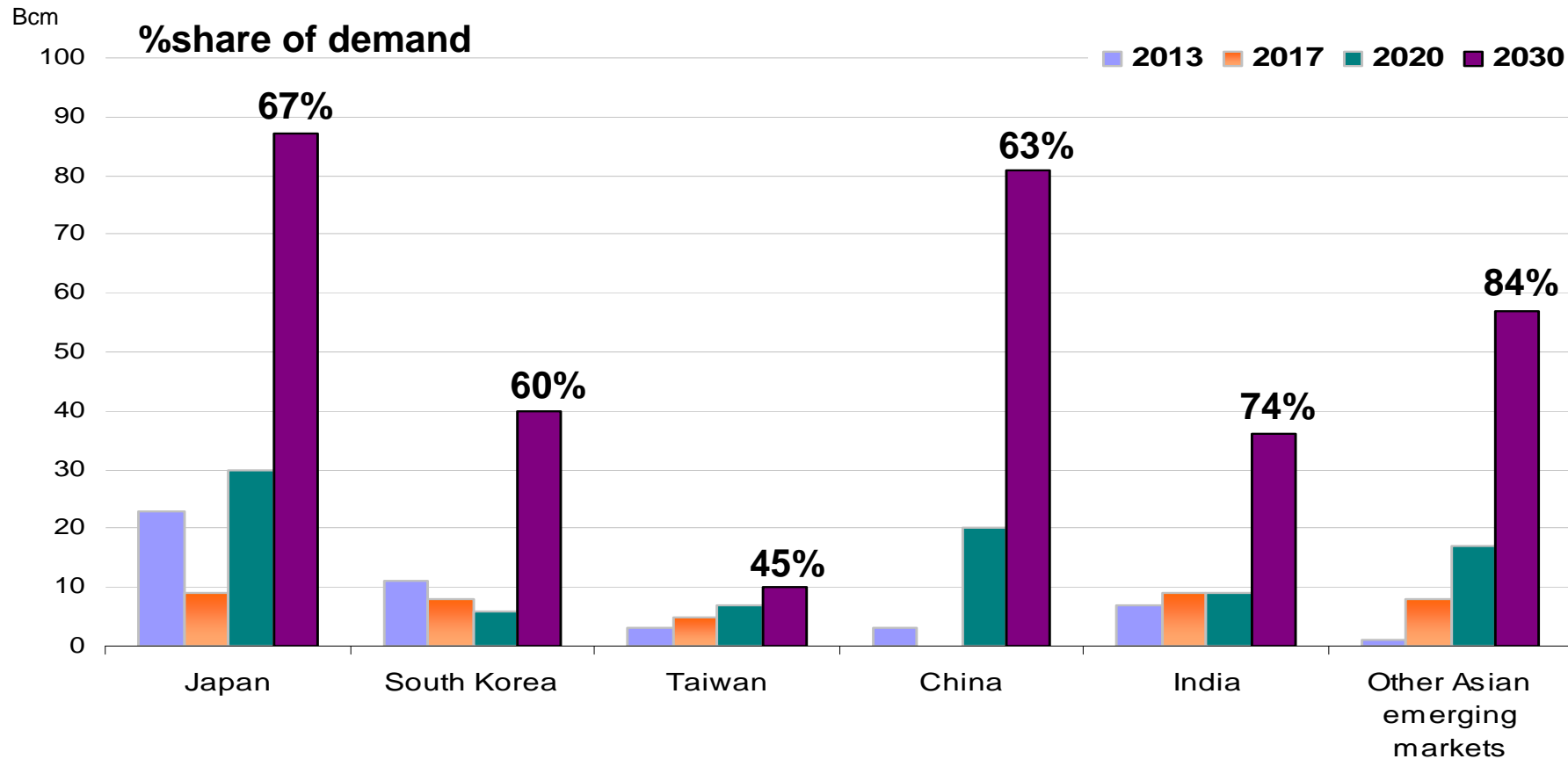
Main challenges ahead

- Lack of infrastructures (mainly cross-border pipelines)
- Strong investment requirements along the whole gas chain
- A large part of domestic prices continues to be regulated through a subsidy regime:
 - Expansion of gas demand
 - A major deterrent to investment (for producers and importers)
 - Prominent political issue (India)
- Absence of 'gas to gas' competition and of a trading hub able to create a reliable and transparent price signal
- A lack of a competitive wholesale market, even in mature markets
- Economic concerns of wholesale supply based on oil indexation
- The original rationale for oil-indexation can be questioned (Japan)



Supply challenges

Evolution of uncontracted LNG demand

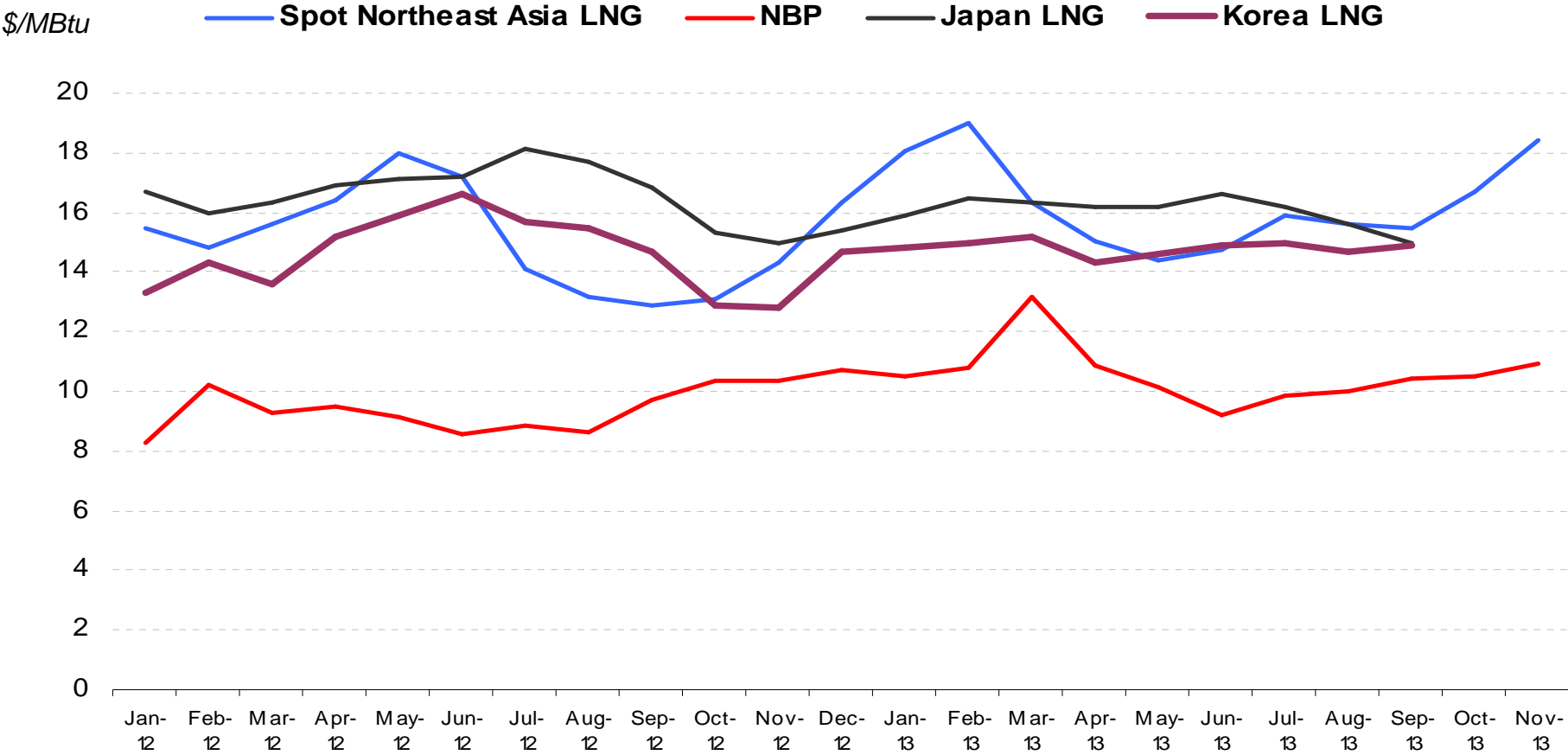


Notes: Are taken into account long and short-term contracts (including portfolio) as well as HoAs.

Source: CEDIGAZ LNG Contracts Database



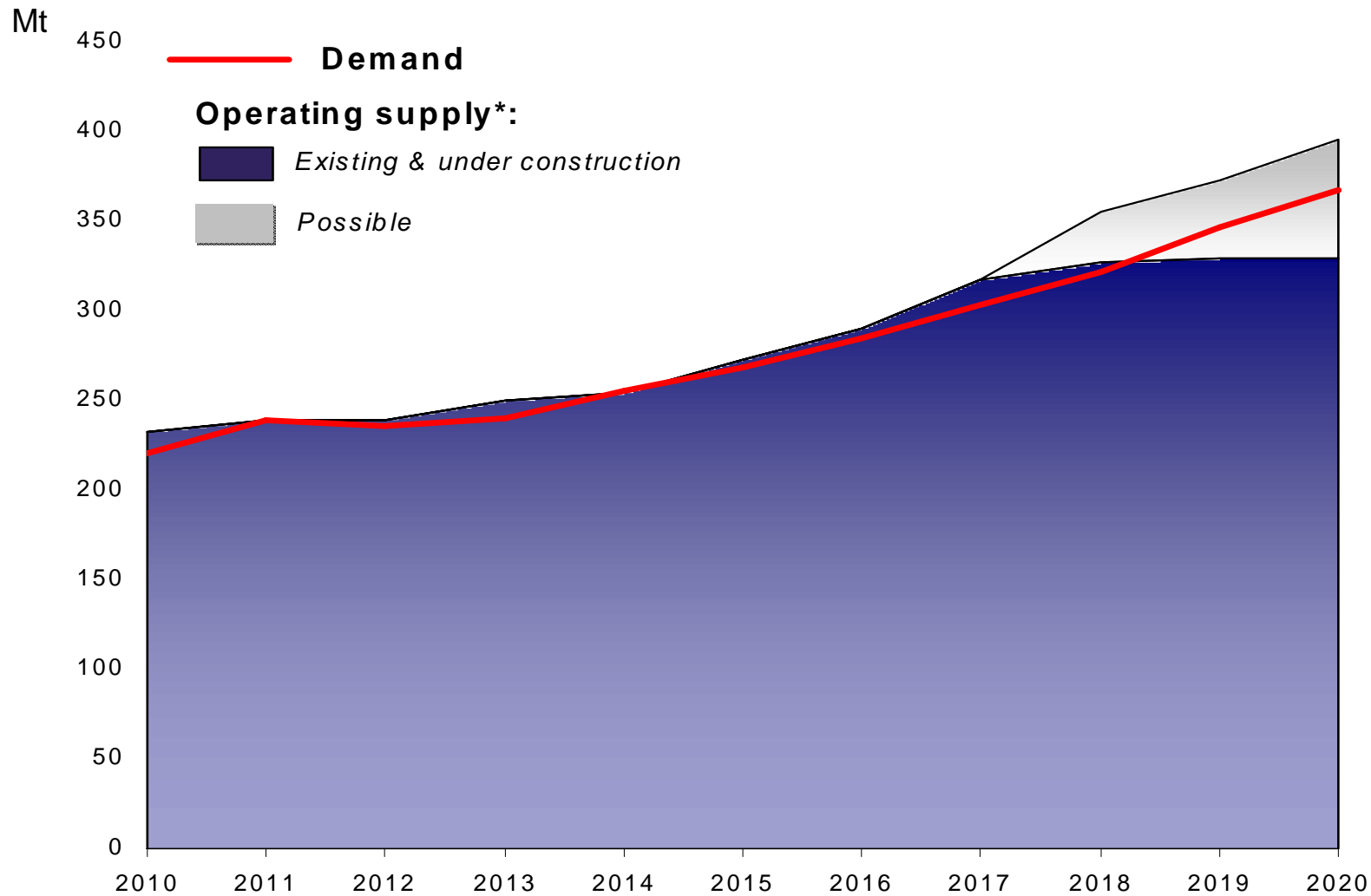
Prices, spot versus oil-indexed



Source: Reuters, World Bank, Energy Intelligence



A tightening global market

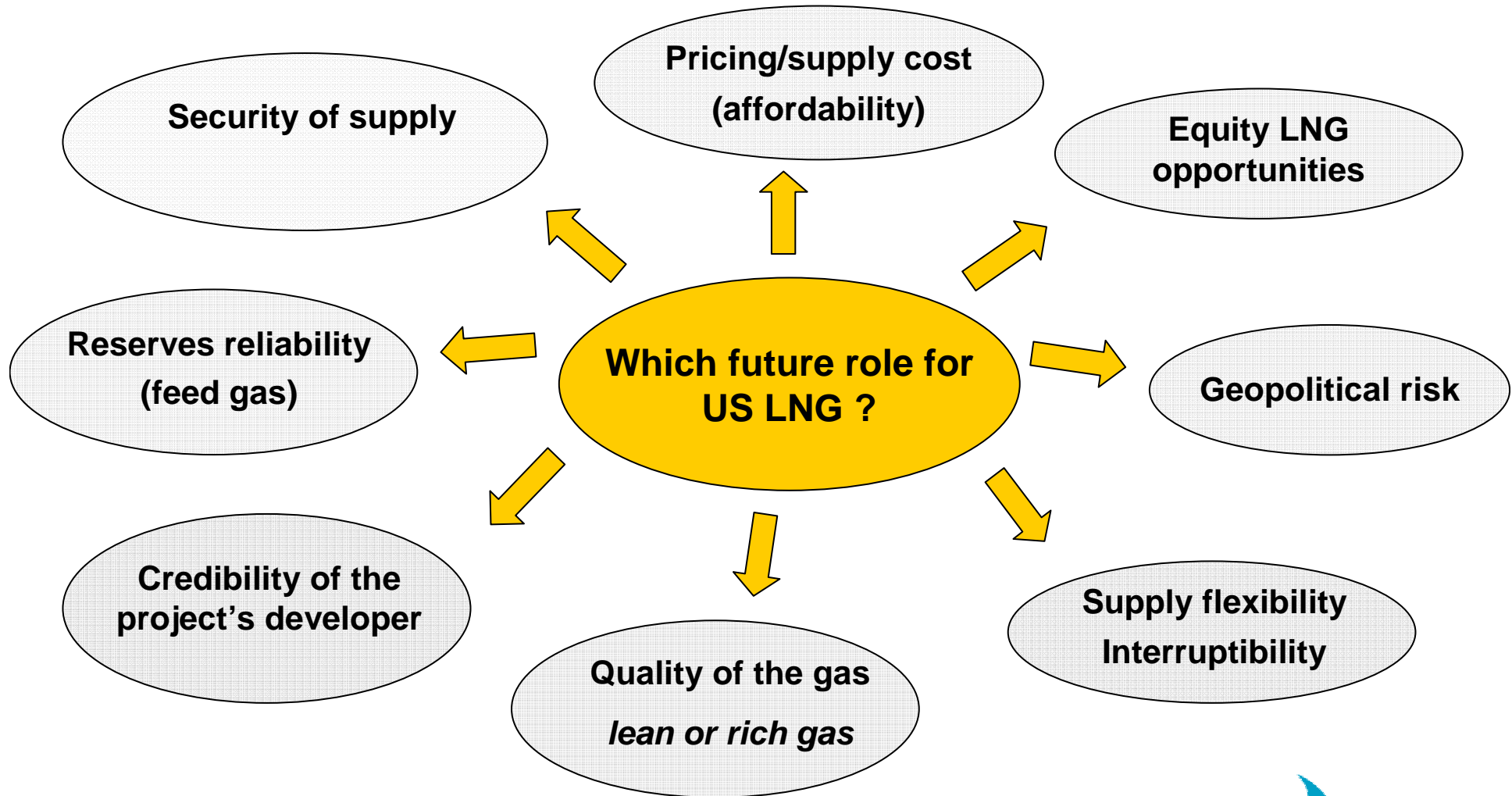


* Operating supply (85% of nominal capacity)

Source: CEDIGAZ



Project-selection criterion



CONCLUSION

- Past and recent factors point to a remarkable growth of the Asian market in the medium and long term
- This growth will depend on structural and institutional evolutions on the Asian market
- Some regulatory and liberalization reforms have already been initiated to support the development of gas but this will require a long process
- Oil-indexation will prevail for a long time (but which slope?)
- Supply flexibility must be improved (relaxation of destination clauses, quantity tolerances) to create a competitive gas market
- Marketing innovations expected in new long-term contracts to enhance flexibility whilst preserving investment security
- A growing portfolio approach (LNG portfolio, pipeline imports, unconventional gas) is implemented
- Regional cooperation among Asian buyers is very important

