The context

- Advances in technology have led to a surge in unconventional gas supply in North America

- Many countries are lining up to emulate this success; notably in China, Australia, Europe & Latin America

- But concerns remain that production might involve unacceptable environmental & social damage
  - Major implications for local communities, land use & water resources
  - Serious hazards include the potential for air & water pollution

- Improperly addressed, these concerns threaten to hold back, & perhaps halt, the unconventional gas revolution
The “Golden Rules” are principles that can allow governments, industry & other stakeholders to address these environmental & social impacts:

1. Measure, disclose & engage
2. Watch where you drill
3. Isolate well & prevent leaks
4. Treat water responsibly
5. Eliminate venting, minimise flaring & other emissions
6. Be ready to think big
7. Ensure a consistently high level of environmental performance

They are “Golden Rules” because their application can ensure operators have a “social license to operate”, paving the way for a golden age of gas
Fracturing the status quo

Natural gas supply growth in the Golden Rules Case, 2010-2035

Total gas production grows by 55% to 2035; unconventional gas accounts for nearly two-thirds of the growth & its share in total output rises from 14% today to 32% in 2035
Fracturing the status quo

Natural gas supply growth in the Golden Rules Case, 2010-2035

Combined unconventional gas output growth from the United States, China & Australia surpasses that of all conventional producers - mainly the MENA region & Russia
Global energy demand in the Golden Rules Case

Global natural gas demand growth equals the combined increase from coal, nuclear & oil; resulting in gas overtaking coal as the second most important fuel.
Emerging economies take the lead

Natural gas demand growth in the Golden Rules Case, 2010-2035

80% of growth in gas use comes from outside the OECD; chiefly in Asia & the Middle East...
80% of growth in gas use comes from outside the OECD; chiefly in Asia & the Middle East ... ... driven largely by demand for electricity and from industry
A huge task for industry & regulators

More than one million new unconventional gas wells would be needed globally to 2035: applying the “Golden Rules” could raise costs slightly, by 7% for a typical shale-gas well
What if the tide turns?

Selected natural gas trade volumes, 2035

Gas trade in the Low Unconventional Case is up 30%, some trade patterns are reversed, gas prices are higher & the position of the main conventional exporters reinforced.
Benefits to gas importers from improved energy trade balances & lower prices disappear in a Low Unconventional Case, where worldwide gas import bills by 2035 are 60% higher.
Coal fills the gap left by gas

Change in primary energy demand in the Low Unconventional Case relative to Golden Rules Case, 2010 to 2035

Emissions are 1.3% higher in 2035 than in the Golden Rules Case, offsetting the claim that a reduction in unconventional gas output brings net environmental gains.
The “Golden Rules” can address the environmental & social impacts of unconventional gas – making the golden age of gas a reality

Continuous drive needed from governments & industry to improve performance if public confidence is to be earned or maintained

Unconventional gas can transform energy markets by:
- putting downward pressure on prices
- broadening diversity & security of gas supply

Natural gas has a role to play in a low-carbon energy economy, but increased use in itself is not sufficient to reach the 2°C goal

IEA creating a high-level platform on the key policy & regulatory issues to build on the “Golden Rules” & respond to G8 leaders’ request