

Jeremy Bentham

Vice President Business Environment, Royal Dutch Shell

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Shell energy scenarios to 2050

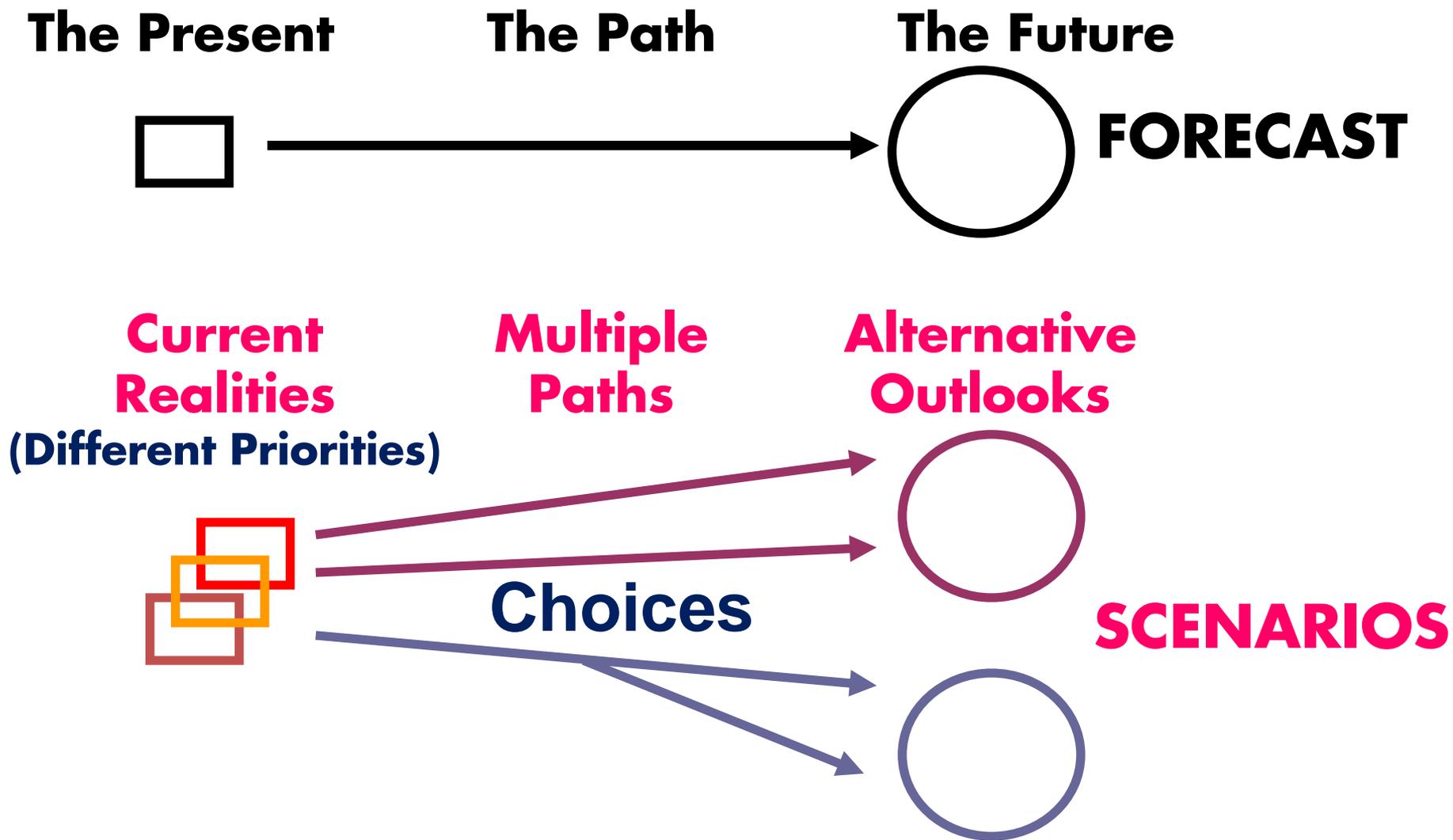
SIGNALS & SIGNPOSTS

CAUTIONARY NOTES – Risks Ahead!

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Uncertainty & Discontinuities are inevitable; Scenarios help wrestle with possible outlooks



2008 ENERGY SCENARIOS TO 2050

Demography



Demand



Environment



Choices



Resources



Technology



**National supply focus
and reactive change**

BLUEPRINTS

SCRAMBLE

**Emerging coalitions
and accelerated change**

Energy drivers and the zone of uncertainty

2050

Underlying
Demand
Potential

Ordinary
Demand
Moderation



Zone of extraordinary
opportunity or misery

2000

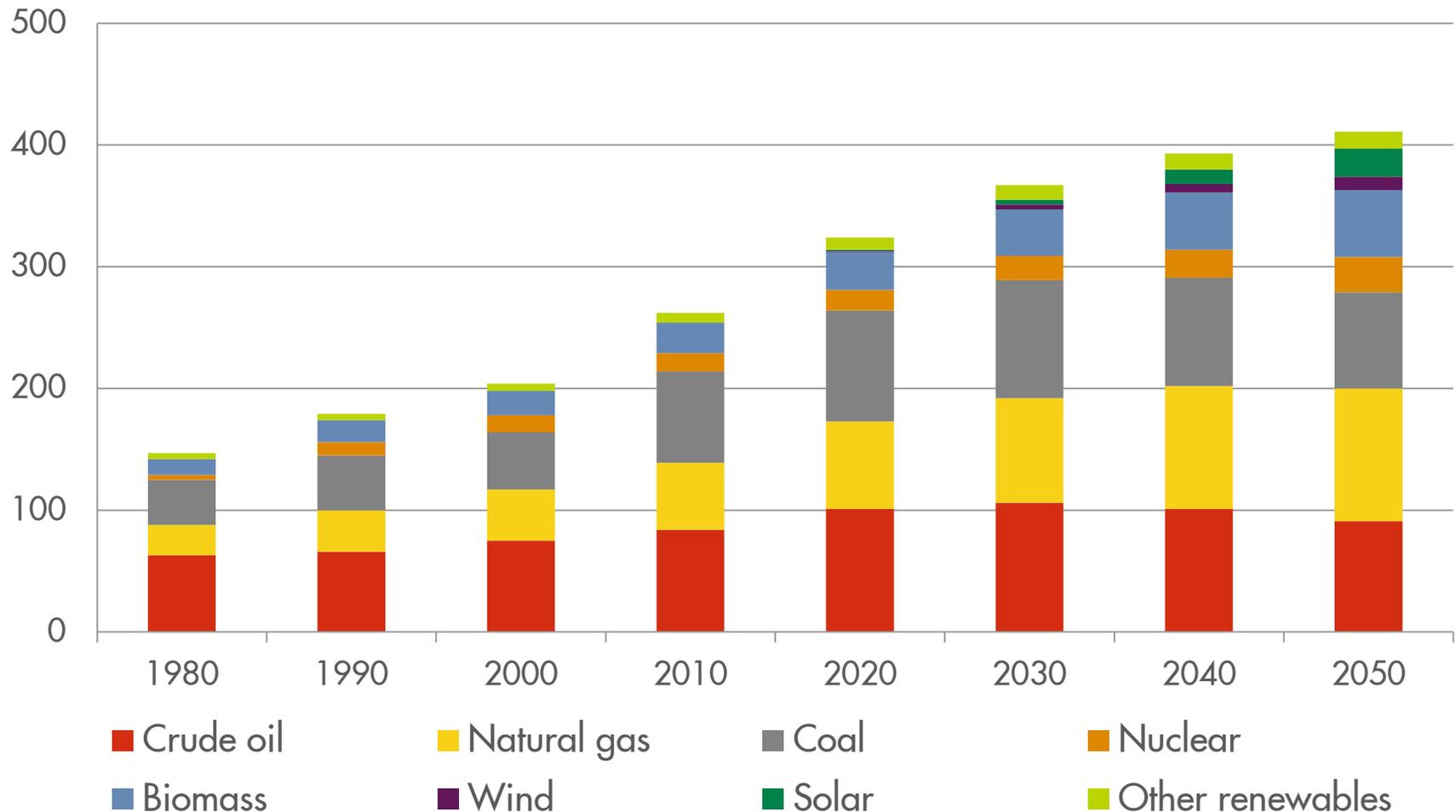
Energy
supply/demand
balance

Ordinary
Supply
Development

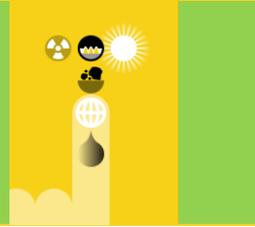
World – Total Primary Energy.....

PROJECTED GLOBAL ENERGY DEMAND TO 2050

million barrels of oil equivalent a day



ENERGY GAMECHANGERS...?



Production developments:

- Rapidly emergent natural gas, abundant and affordable
 - US (and elsewhere) unconventional gas
 - Will full potential be realised...?

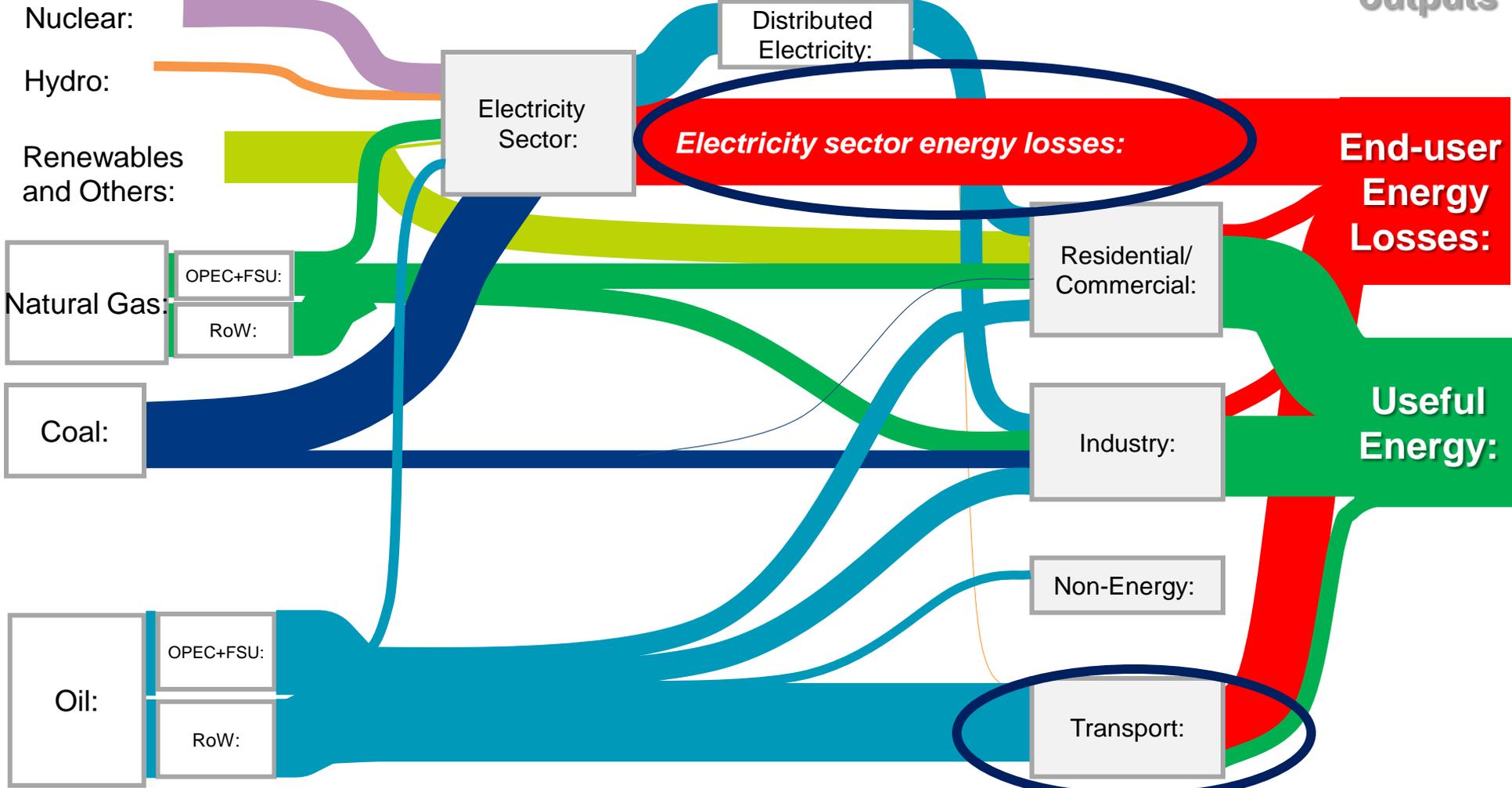
Consumption developments:

- Shift in consumption balance from West to East
- Urbanisation: \$300+ trillion investment required by 2040 to build new cities (principally Asia)

CITIES IN THE ENERGY WEB



Source inputs

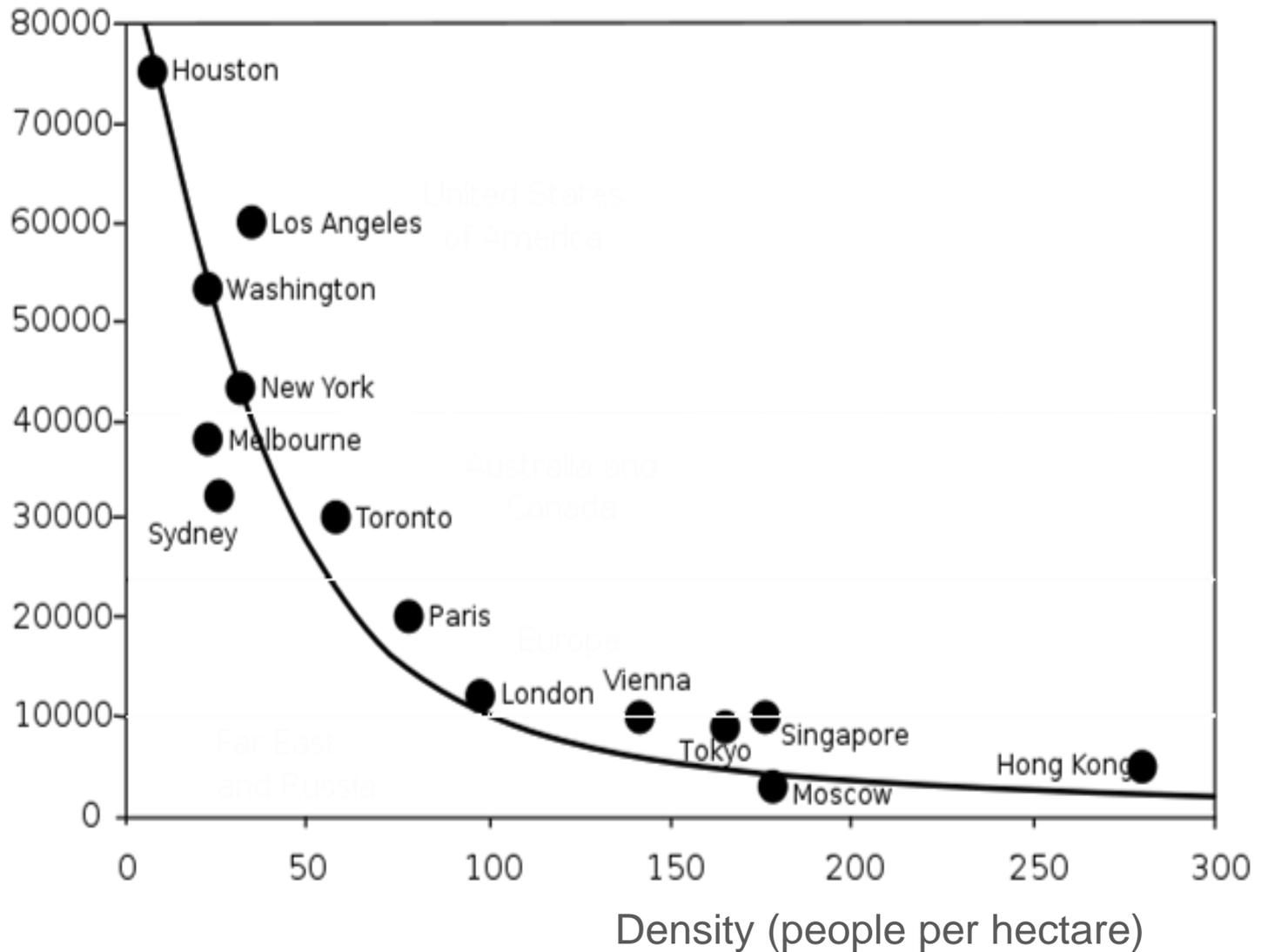


Based on data from IEA, plus Energy Balances of Non-OECD Countries 2002-2003. Units EJ.

Urban population density ...



Per Capita
petroleum
use p/a



Scramble or Blueprints?



VERDICT:

- ❖ Progress currently slower than *Blueprints*
- ❖ Economic and political volatility threaten to depress pace of change further – greater investment risks

If 450ppm = 2°C, *Blueprints* still is not fast enough

Is freshwater the next CO2?

40% global shortfall in freshwater availability by 2030
(based on current trends)

Looking forwards from 2012...

Intensified
economic cycles
and the end to
'moderation'

Heightened
political
instability

We have entered an
'era of volatile transitions'

Significant
demographic
transition –
urbanisation

New political
consensus
building – a *mini-
lateral* world

Challenged
environmental
boundaries

...fuelled by major Paradoxes

Implications for Organisations?

- **Risk & uncertainty structurally higher**
 - Liquidity risk – strong balance sheets & deep markets
 - Flawed assumptions risk – deeper strategic dialogue
- **Seek resilience to “Scramble” and *opportunity* through “developing Blueprints”**
 - Evolving stakeholder collaborations, public/private & cross-business
 - Struggle to conceive new collaboration mechanisms

**OPPORTUNITY TO SECURE REAL VALUE,
BUT REQUIRES NEW PARTNERSHIPS & APPROACHES**

Could Europe be an example?

