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Using scenario planning for decision making in the energy industry



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Henk Krijnen



35 years



Thai
Shell



Operations and
economics in the
Netherlands



Seismic in
Indonesia

Since 2015

NavIncerta



Last five years in Shell Corporate
Strategy & Planning, The Hague



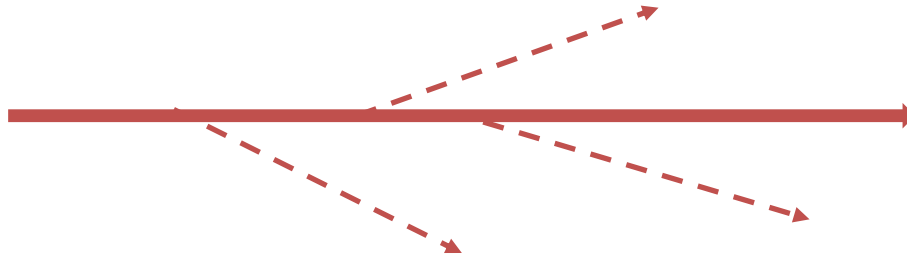
Shell Oil,
Houston

Agenda

- Forecasts and Scenarios
- Example: Shell 1992 Scenarios
- Scenarios focusing on energy
- Decision making
- An oil asset example
- Conclusions

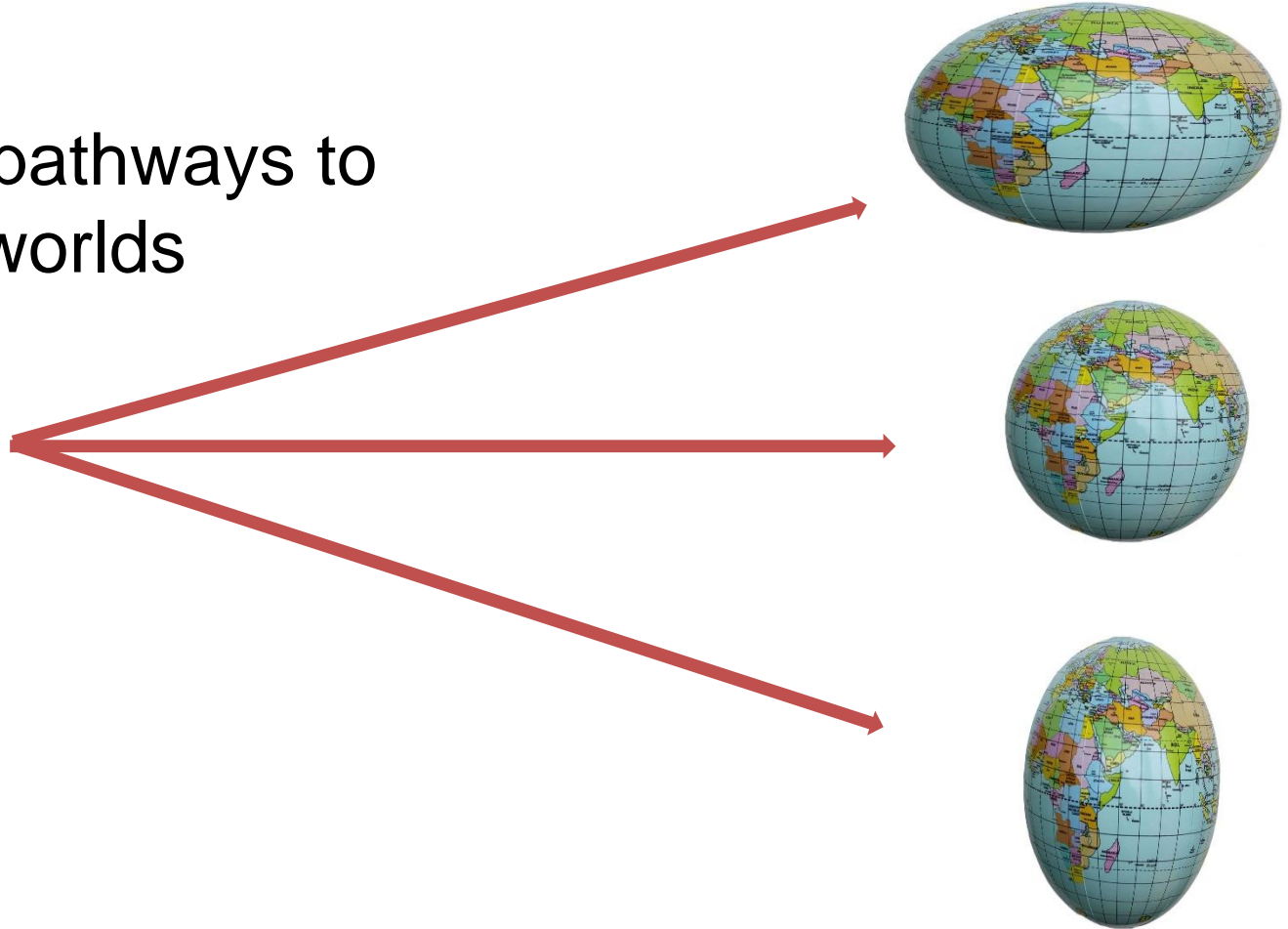
Forecasts

A forecast ('most likely')
with or without some
alternative possible
developments



Scenarios

Different pathways to
different worlds



A heuristic approach: scenarios



- Plausible narratives
- Spanning \pm uncertainty range
- Internally consistent
- ≤ 4



- Forecasts
- Present
-

Scope

- Geographic area

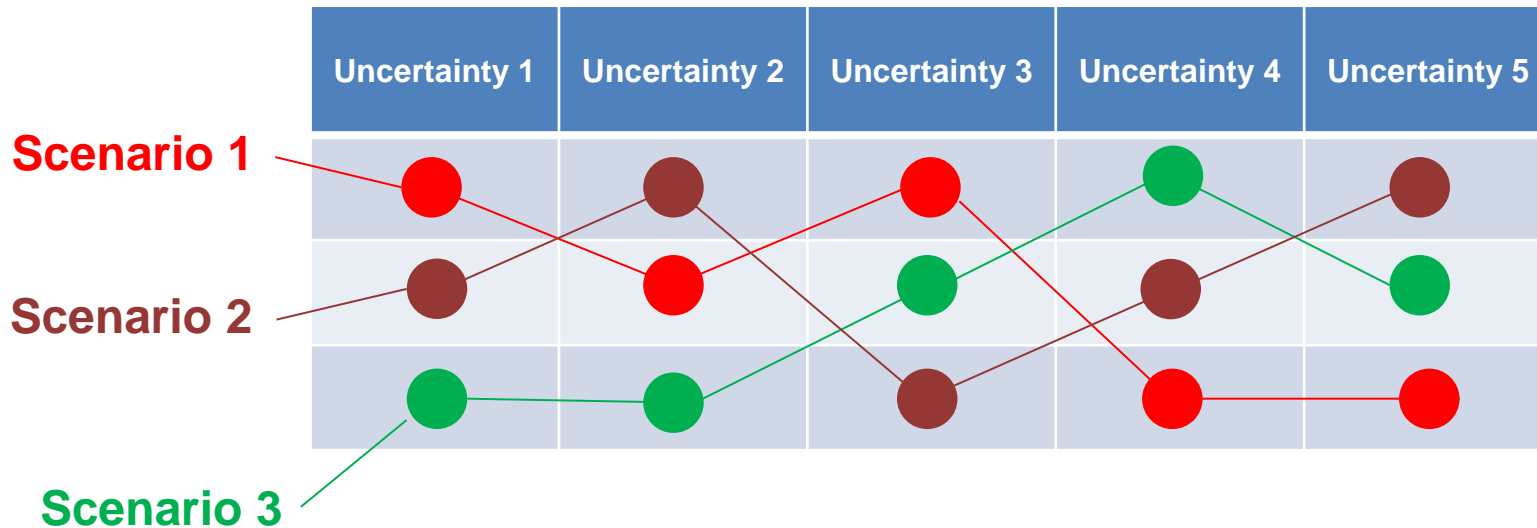
- Time horizon

Purpose

- Bridging gaps
- Public debate
- Framework for strategy
- Decisions

“Memories of the future”

Making the connections



The scenario method is a heuristic approach to reduce the complexity of the external environment to a few internally consistent and logical concepts

Challenging but plausible



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Shell Global Scenarios 1992-2020

GLOBAL SCENARIOS 1992 - 2020

As an example..



“Liberalisation can evoke ***two responses***: individuals, nations and companies can ***seize the opportunities***....

....on the other hand the threats posed by liberalisation to entrenched interests, to the losers and to national, religious and cultural identity, may lead to a predominant atmosphere of fear and resistance, and a ***negative feedback loop***”

Shell Global Scenarios 1992-2020

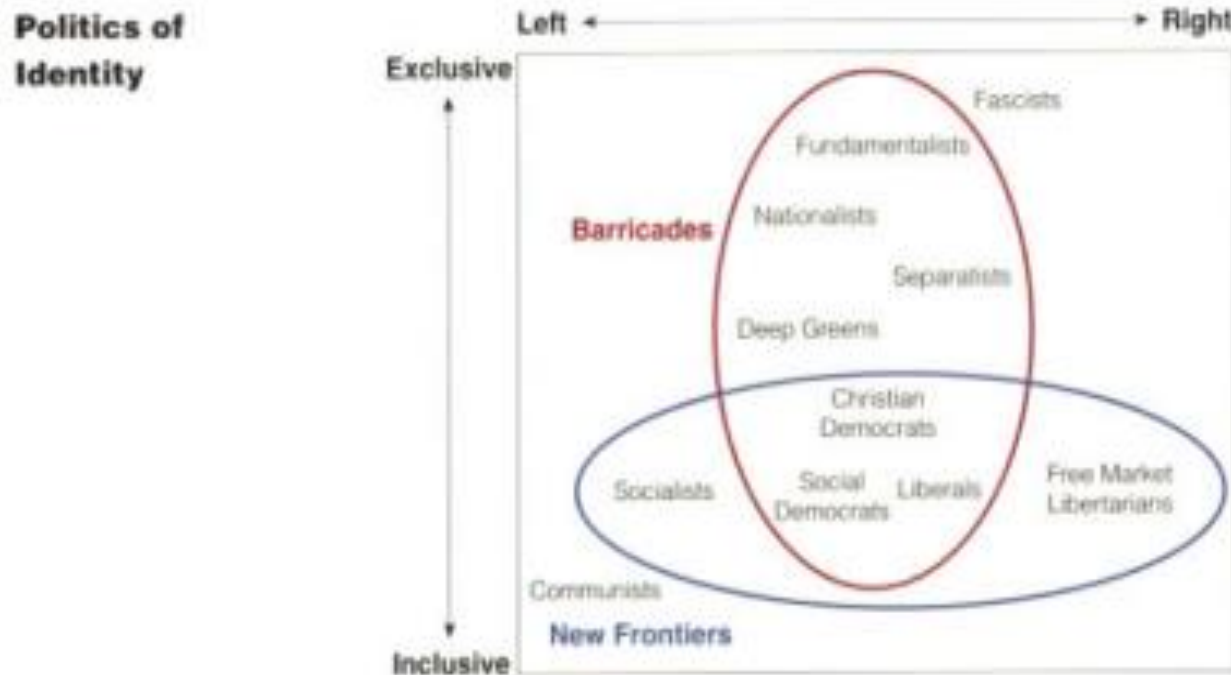
“New frontiers”

- Dramatic growth in poor countries
- Cooperative approach to global problems
- Drive towards democracy
- ...

“Barricades”

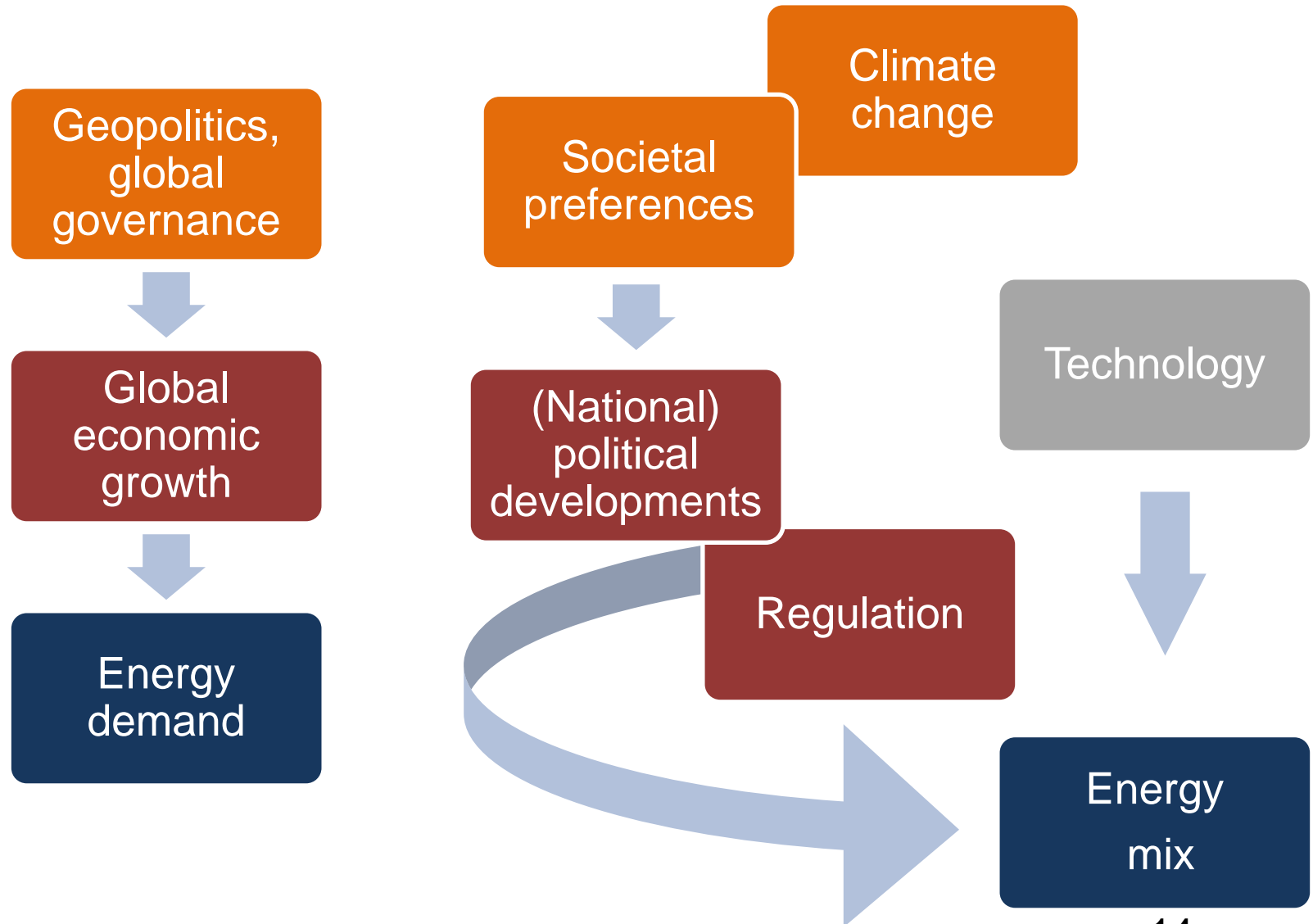
- Resistance against liberalisation/globalization
- Nationalism, protectionism
- Countries have own brand of capitalism
- Fragmented political spectrum – populist parties
- Physical barriers against migration
- ...

Shell Global Scenarios 1992-2020



‘..In this atmosphere, the traditional left-right political debate splinters into a number of competing nationalistic, ethnic, religious, and single-issue groups, making coalition building difficult.’

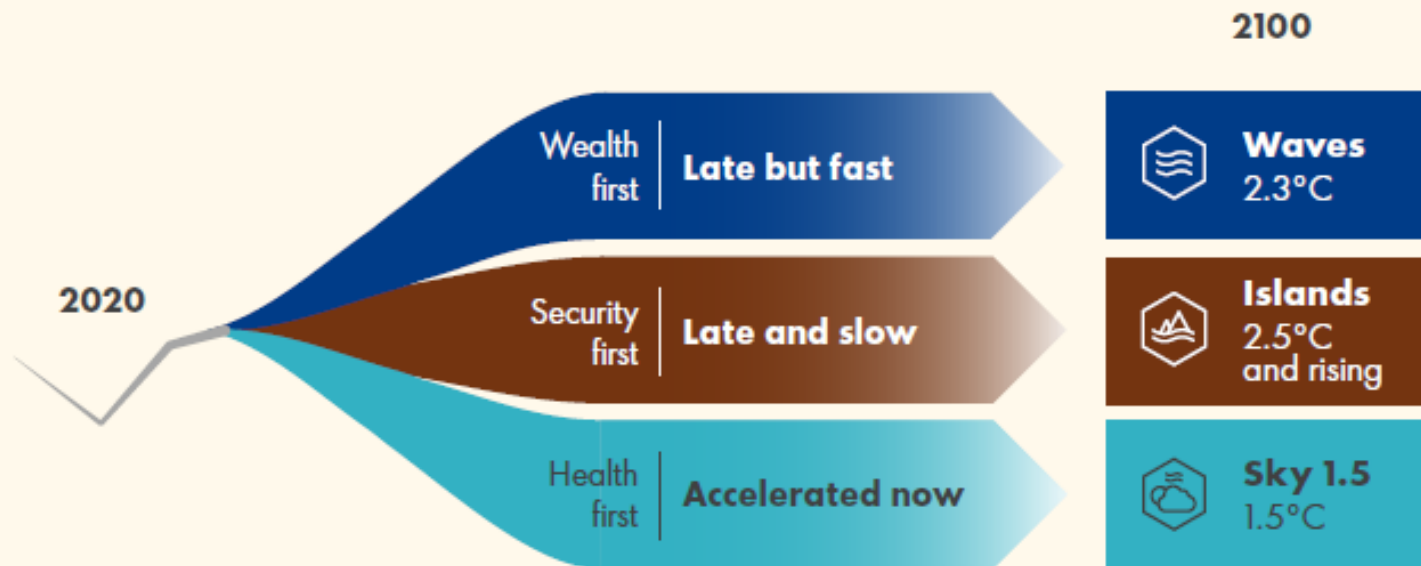
So what for energy?



Agenda

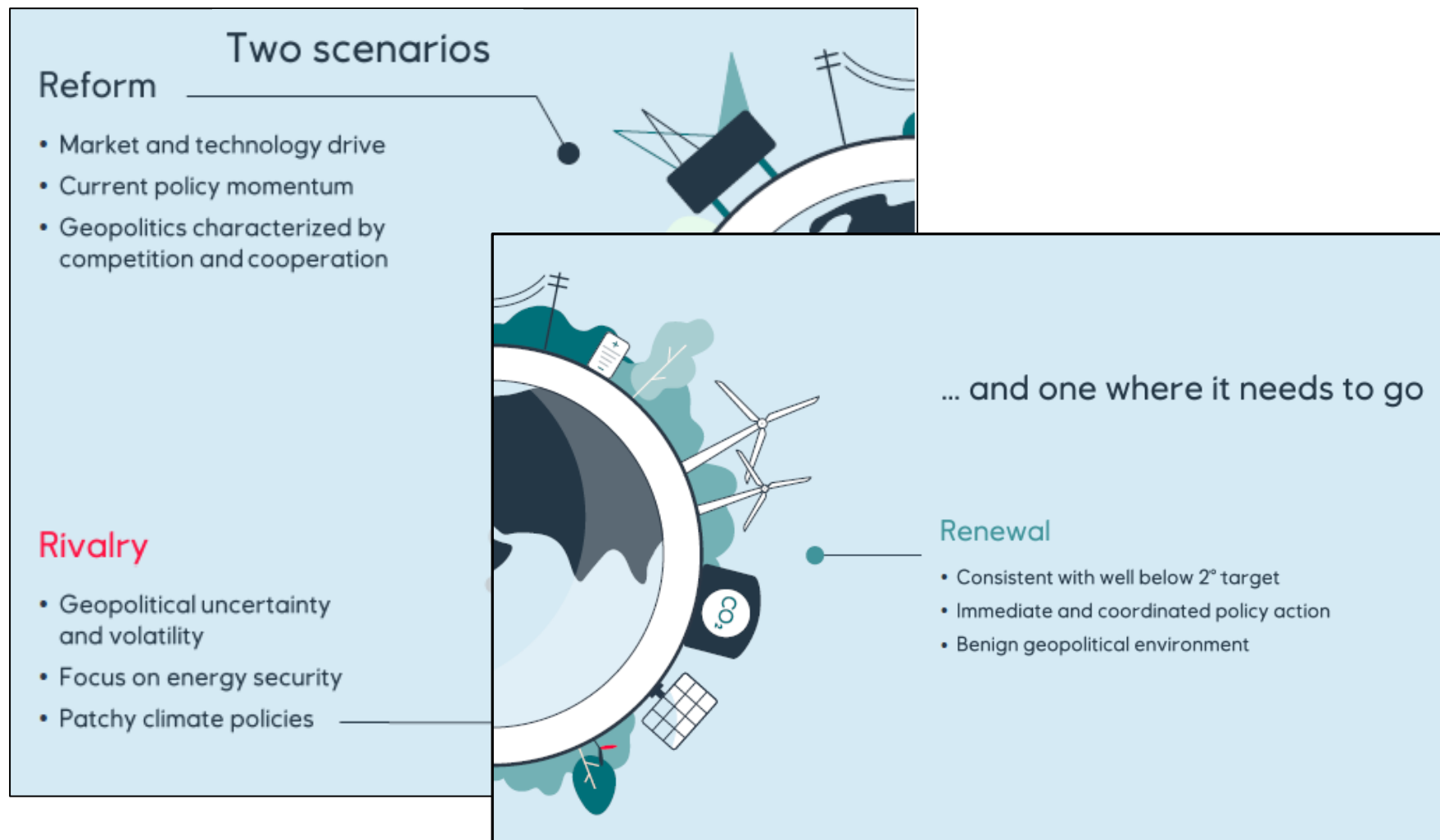
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The Shell 2021 scenarios

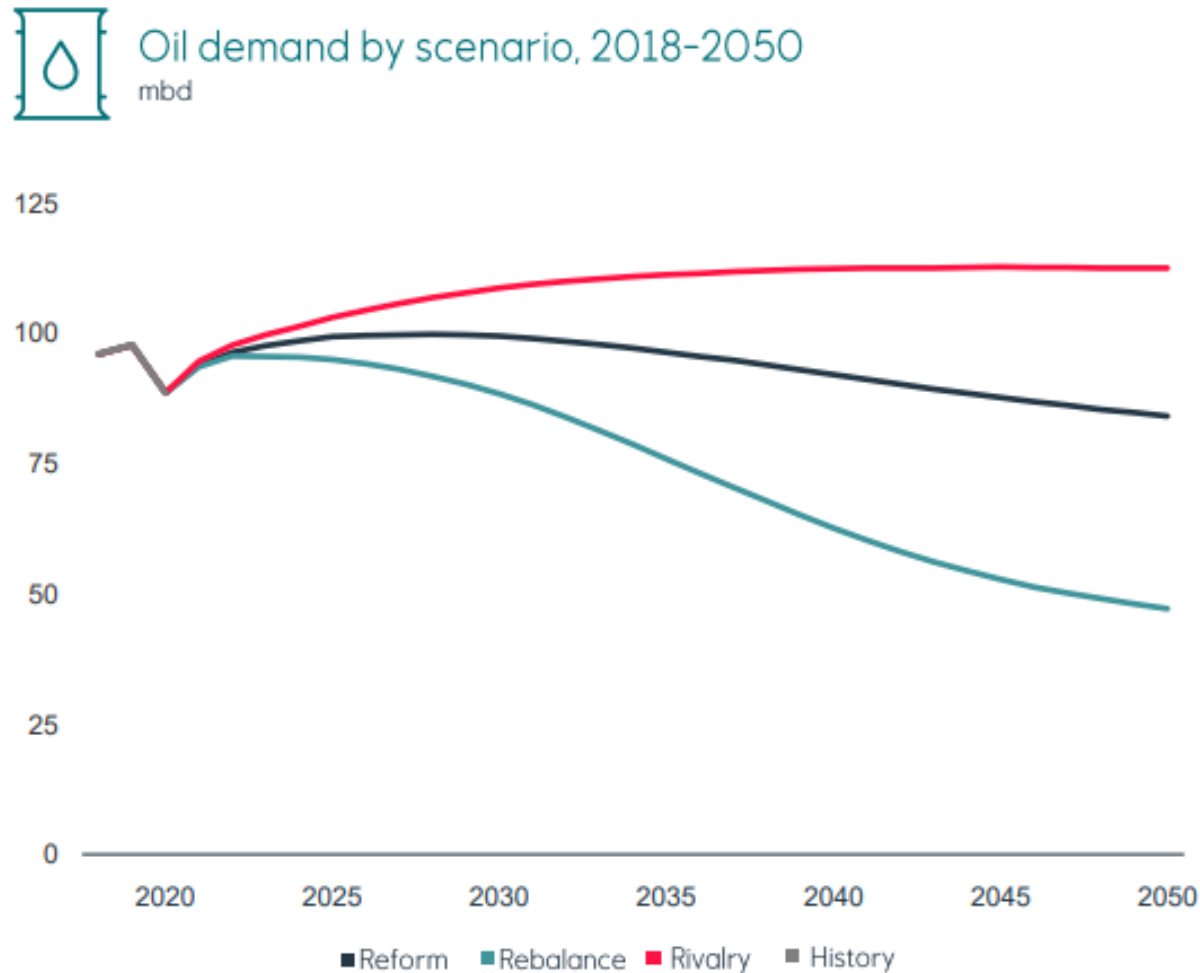


Source: Shell analysis, MIT Joint Program on Global Change

Equinor (Statoil) 2019 scenarios



Equinor 2020 scenarios: outlooks



World Energy Council 2019



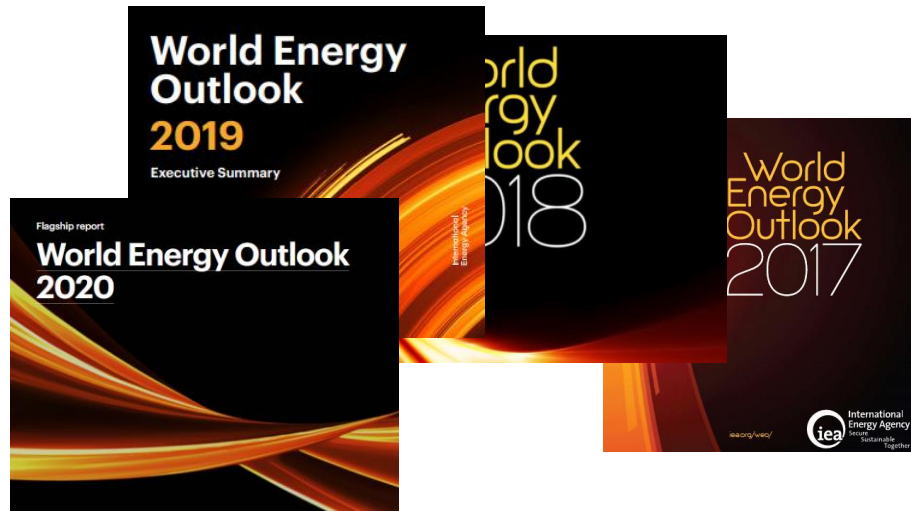
Modern Jazz. A market-led, digitally disrupted world with faster-paced and more uneven economic growth.



Unfinished Symphony. A strong, coordinated, policy-led world, with long-term planning and united global action to address connected challenges.



Hard Rock. A fragmented world with inward-looking policies, lower growth and less global cooperation.



International Energy Agency

- Stated Policy Scenario
 - ..based on **policies currently in place**
- Delayed Recovery Scenario
 - ..based on **policies currently in place but given the pandemic**
- Sustainable Development Scenario
 - ..**all is done** to achieve objectives (e.g. 'Paris')
- Net Zero Emissions by 2050
 - .to achieve **net zero emissions** by mid century

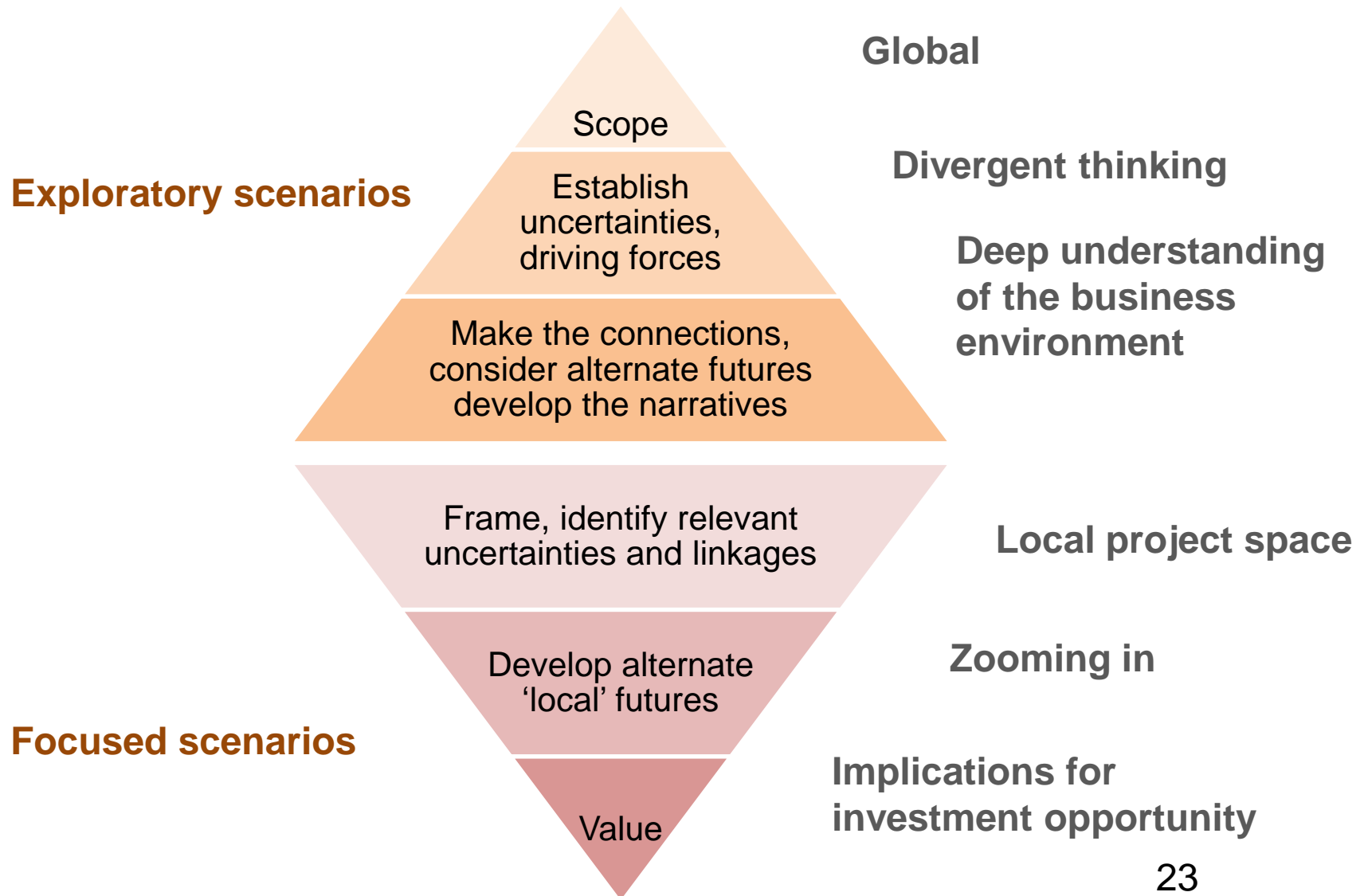
A crude categorization

Organization	National Orientation	Market & Technology Drive	Green Policies towards 2deg
Shell (2021)	Islands	Waves	Sky 1.5
Equinor (annual, 2020)	Rivalry	Reform	Rebalance (Renewal before)
World Energy Council (2019)	Hard Rock	Modern Jazz	Unfinished Symphony
IEA (annual, 2020)	N/A	N/A	Sustainable Development
BP (annual, 2020)	N/A	N/A	Net Zero

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Exploratory and Focused scenarios



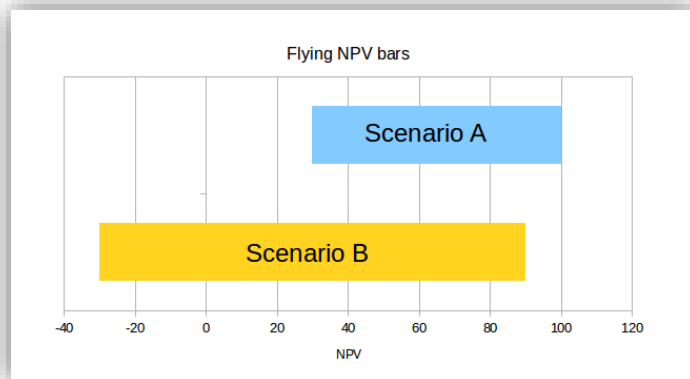
Scenarios and decision making



The gentle art of re-perceiving

Wind tunneling

Strategy	Scenario 1	Scenario 2	Scenario 3
X	+	-	++
Y	-	+	+
Z	+	--	++



Impact on typical decision metrics

Pierre Wack about Scenario Planning (1986)

Microcosms



Source: Youtube, Oxford Futures Library

Pierre Wack

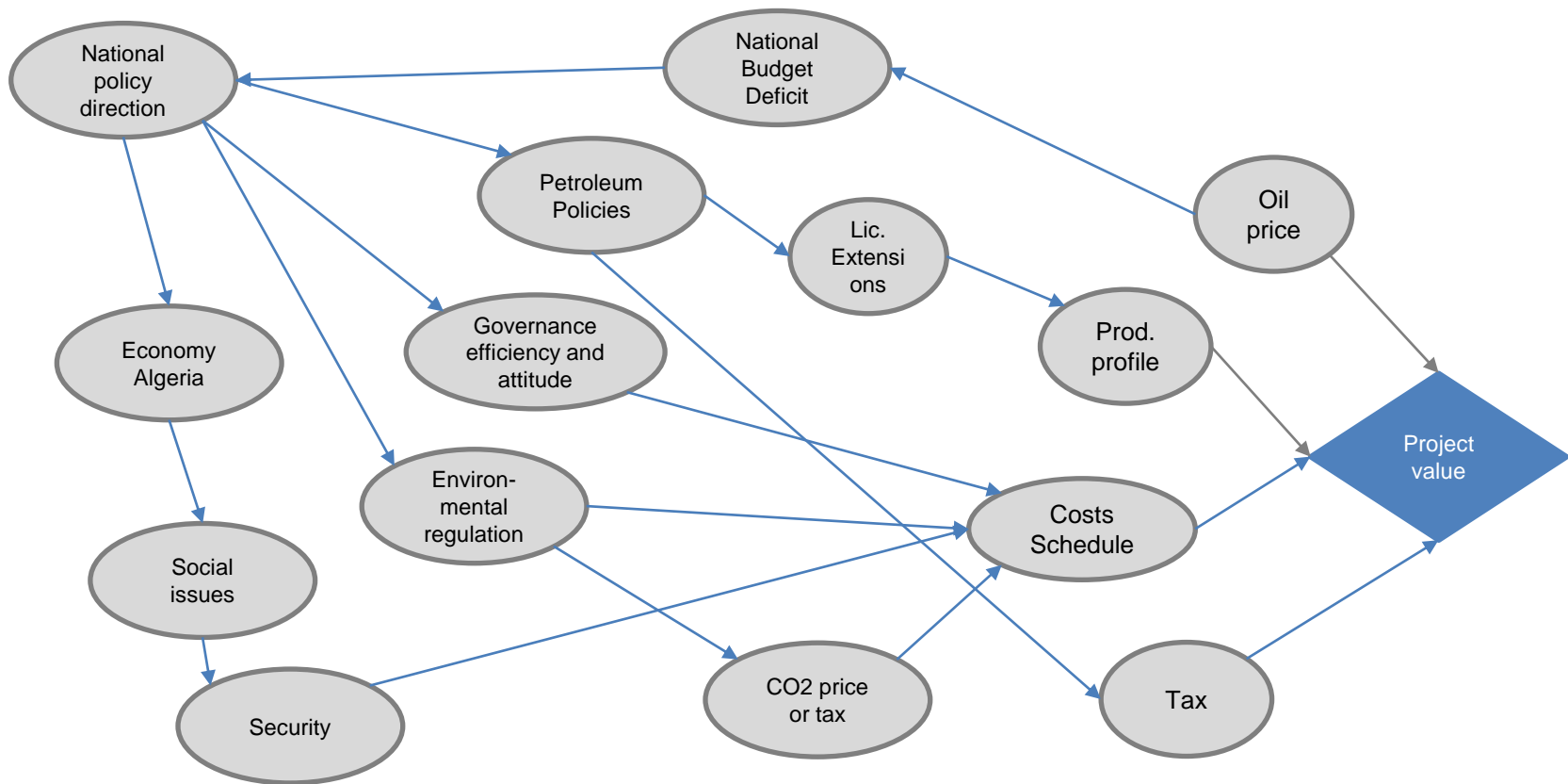
(1922-1997)

**STRATEGIC PLANNING:
A DISCIPLINE FOR AN ART**

Agenda

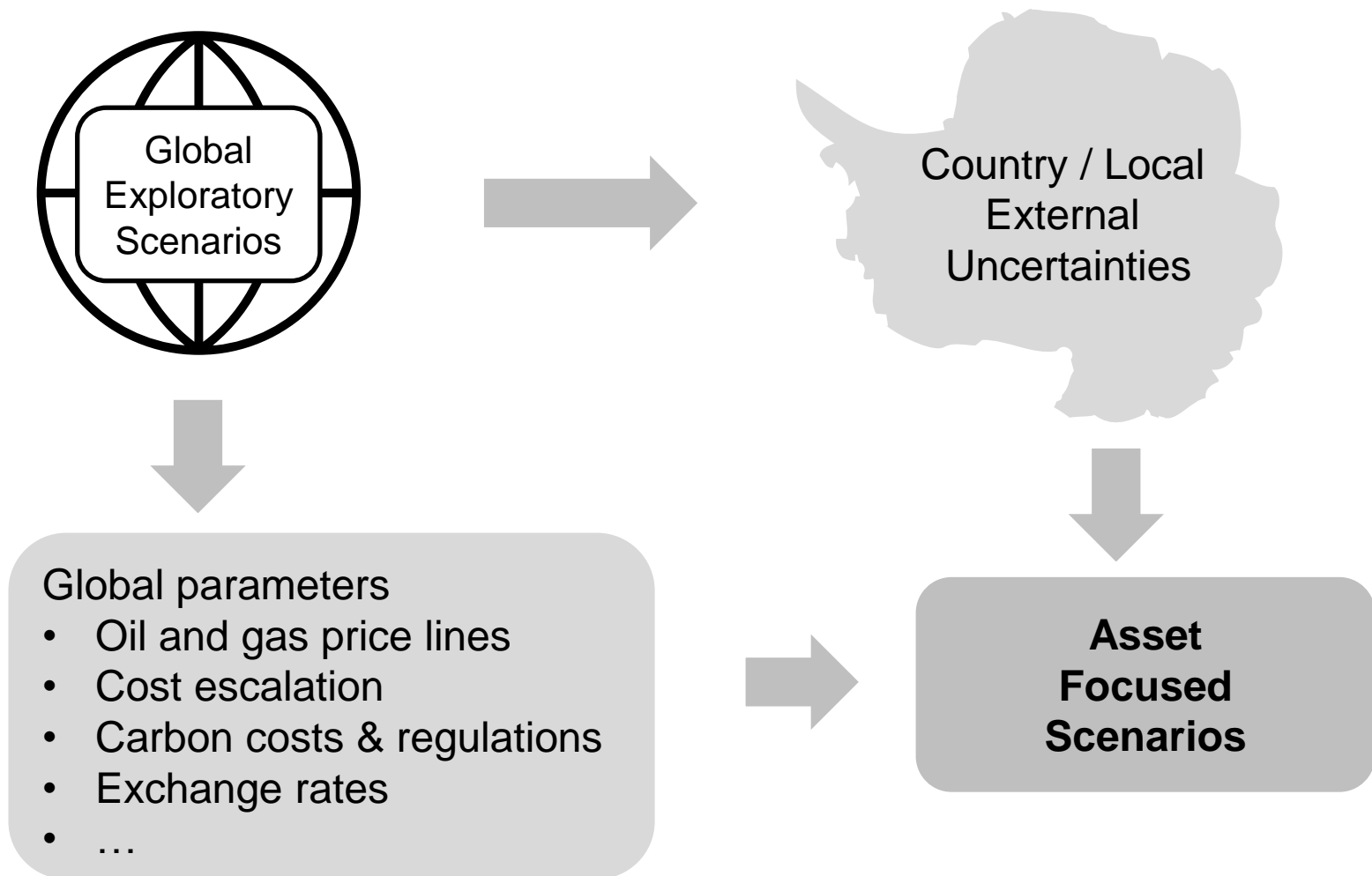
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Influence diagram investment in Algeria

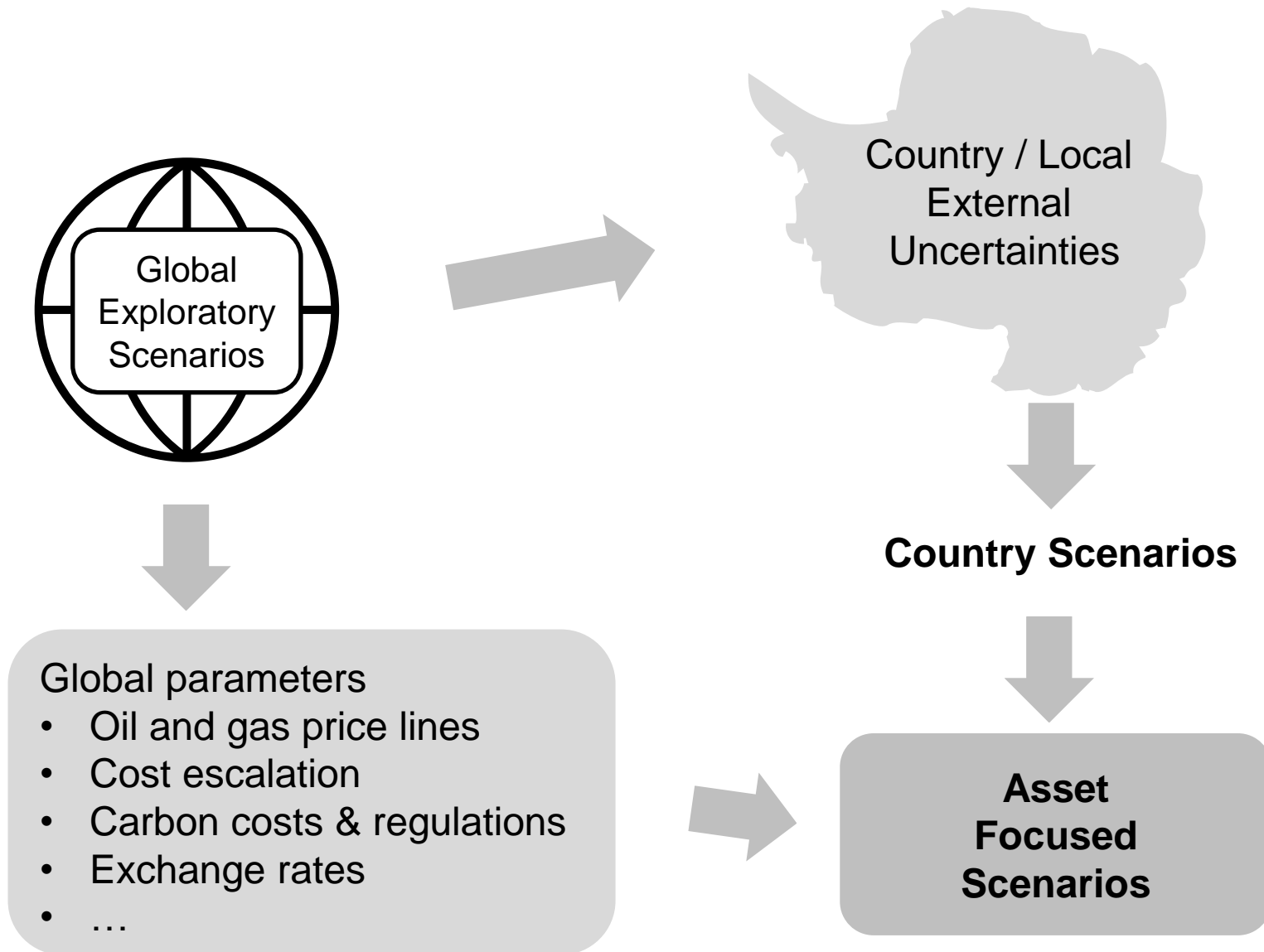


Basis for focused scenarios

Focused asset scenarios



Focused asset scenarios



Example country scenarios

Algeria, 2017

First, paint the picture, identify the issues

Challenges

- Presence of state industries
- Insufficient trained personnel
- Urbanization (potential unrest)
- Vast territory
- Issues with neighbours
- Exposure to climate change
- Exposure to oil price

Strengths

- Strong state, relative stability
- Maturity of oil and gas industry
- Potential for renewable energy
- Experienced technocrats in key positions
- Enhanced security

Example country scenarios

Algeria, 2017

Identify the key driving forces

- Oil price and state income
- Government policies and efficiency
- Regional geopolitical developments and opportunities
- Impact of climate change and environmental issues
- Domestic social and security issues

Brainstorm different outcomes and combine in a set of logical scenarios

Some possible scenarios for Algeria (as per 2017)

- High oil price
- Limited reforms
- Focus on oil and gas, limited renewables
 - Social stability
 - Environmental adaptation

- Low oil price
- Successful reforms
- Diversification of energy industry
 - Social unrest mitigated
- Environmental adaptation

- Low oil price
- Limited reforms
- Slow transition to renewables
 - Social unrest
- Environmental issues difficult to address

Process the implications



Imagine for each scenario:

- Permitting facilities and infrastructure
- Investment regulations
- National carbon policies
- Taxes
- Environmental regulations
- Joint venture issues
- ...



Cost
Schedule
Volume
Tax
Price

Quantify where possible, consider possible outcomes

How do these logically hang together?

And on this basis, what will the investment look like under the three scenarios?

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Key take aways

- Scenario planning is a way to get to grips with **contextual uncertainties** in the business environment
- Scenarios \neq Forecasts
- The essence: to examine “**what if**” **together**’
- Focus should be on the **underlying driving forces** and **outcomes**
- Distinction between (global) **exploratory** scenarios for generic understanding and **focused scenarios** for specific decisions

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