

Shell energy scenarios to 2050

An era of revolutionary change

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energy

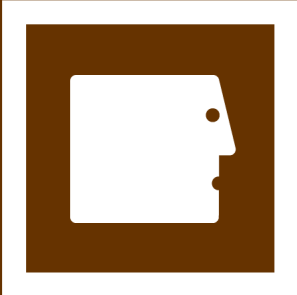


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Scenarios explore alternative futures

The present



The path

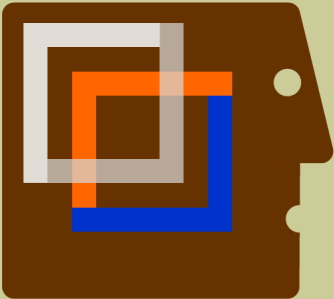


The future

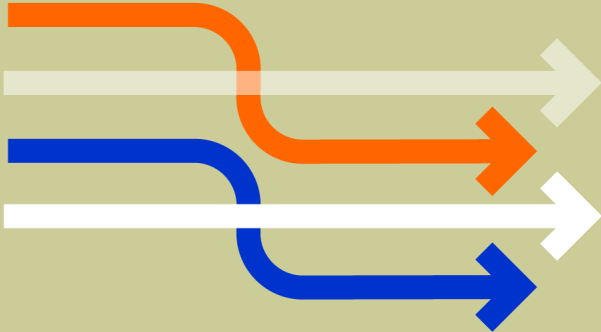


Forecast

Current realities (mental maps)



Multiple paths



Alternative futures



Scenarios

Three hard truths will shape the future of the energy system

- Surge in energy demand
- Supply will struggle to keep pace
- Environmental stresses are increasing

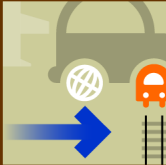


Shell energy scenarios

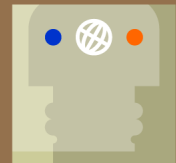
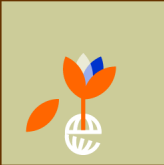
Demography



Demand



Environment



Choices



Resources



Technology



National supply focus
and reactive change

BLUEPRINTS

SCRAMBLE

Emerging coalitions
And accelerated change

Scramble - People at the heart of the storylines ... individually and collectively

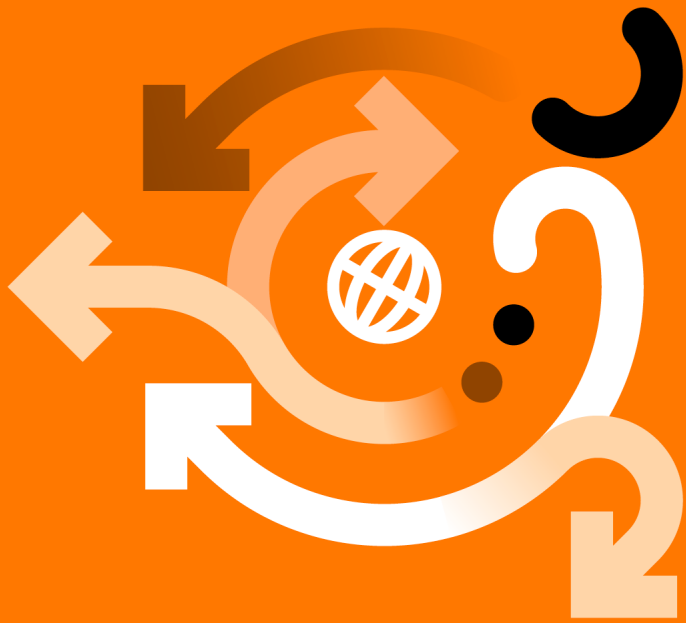
- People choose the easiest option for them
- Fear is not enough to change behaviours
- Climate change is too difficult
- Delegating action to the state
- Adapt rather than change



Blueprints - People at the heart of the storylines ... individually and collectively

- Shared interest not altruism
- Adoption through “mainstreaming”
- Trial, error, collaboration and copying success
- Success is emergent, not centrally driven initially



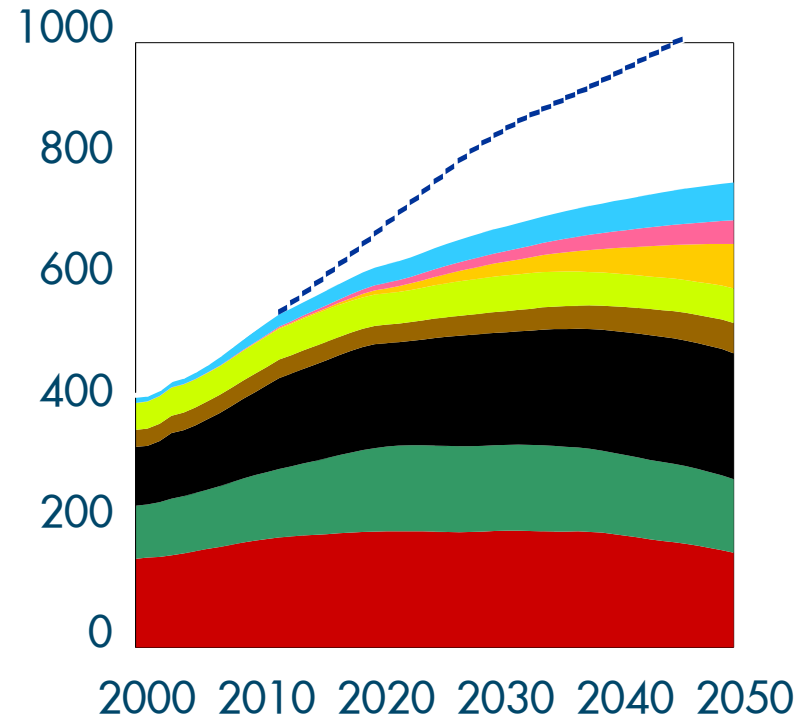
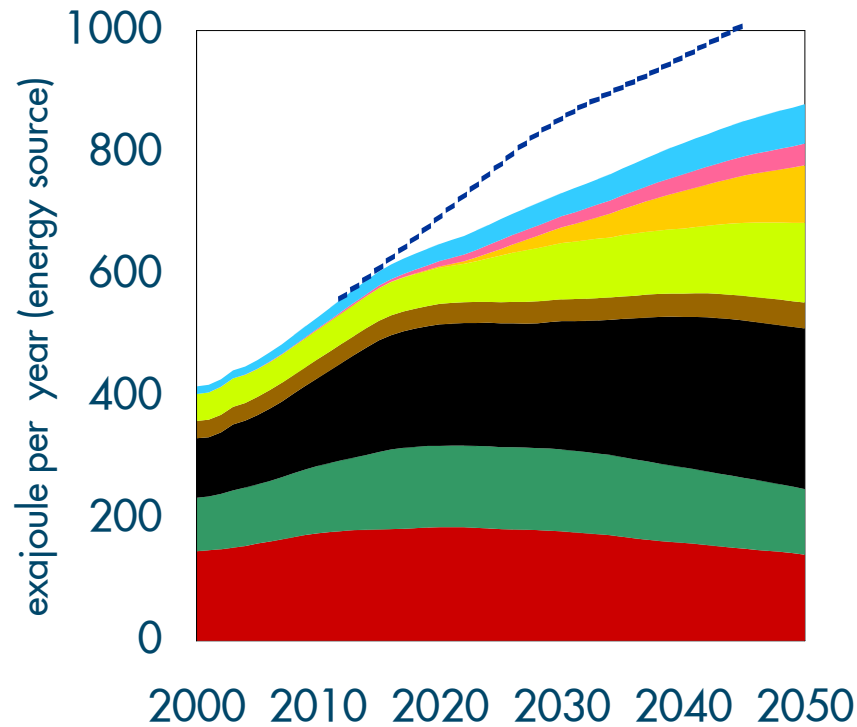


SCRAMBLE



BLUEPRINTS

Comparing the scenarios: energy mix

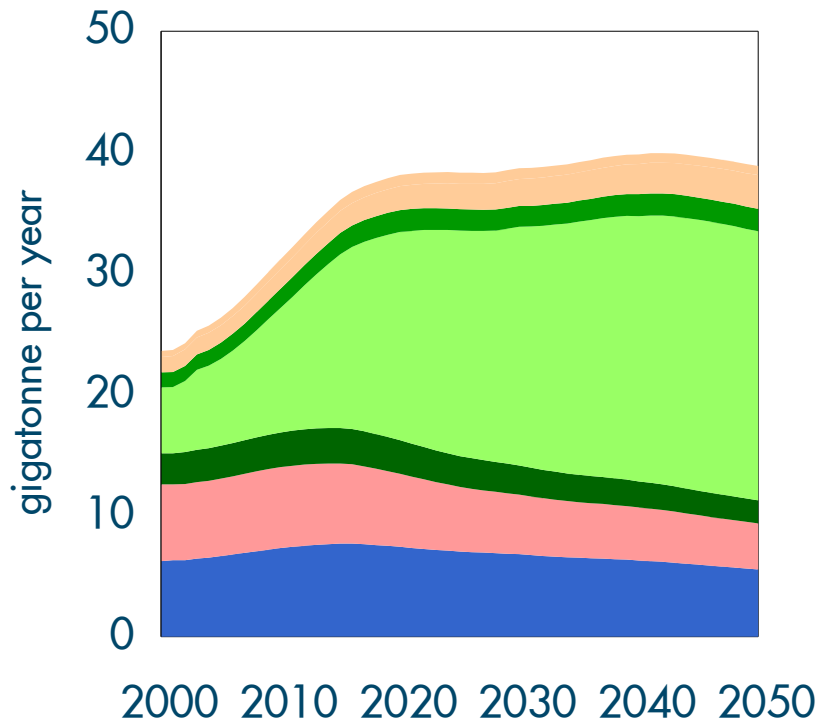


■ Oil
 ■ Gas
 ■ Coal
 ■ Nuclear
 ■ Biomass
 ■ Solar
 ■ Wind
 ■ Other Renewables

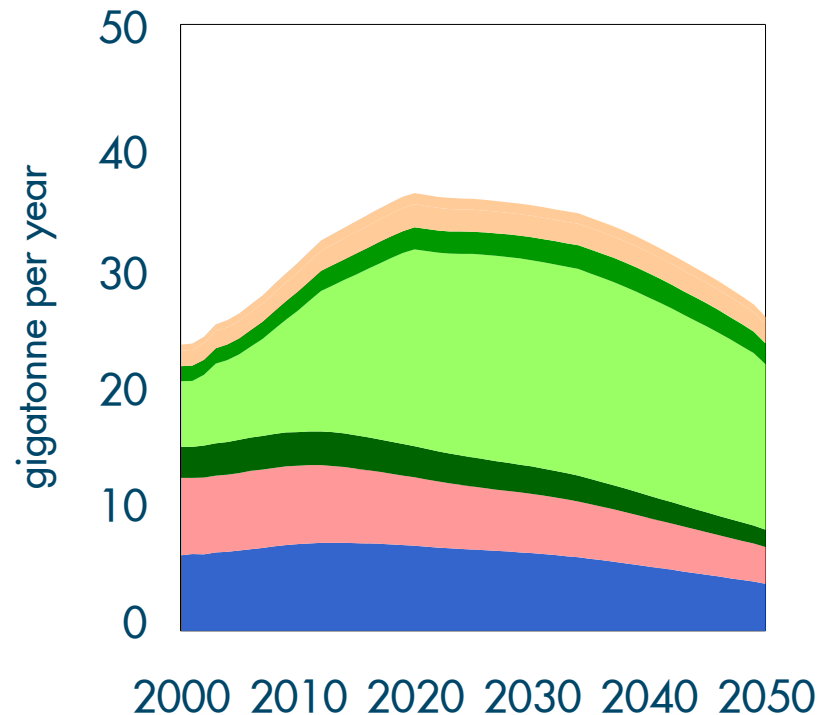
Implications for direct CO₂ emissions from energy



Late reactions



Early actions



■ Europe

■ Asia & Oceania - Developed

■ Latin America

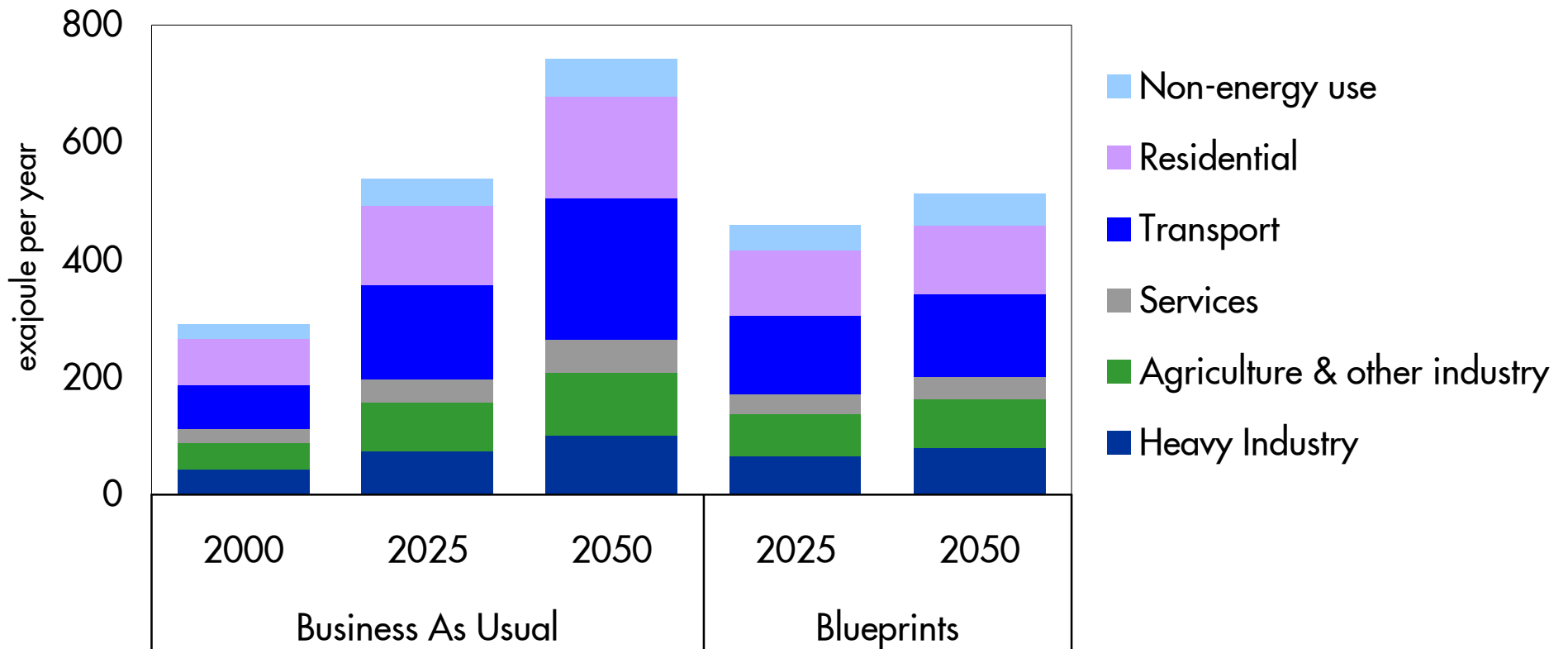
■ North America

■ Asia & Oceania - Developing

■ Middle East & Africa

The scenarios point to sector level e.g. transport, where actions are needed

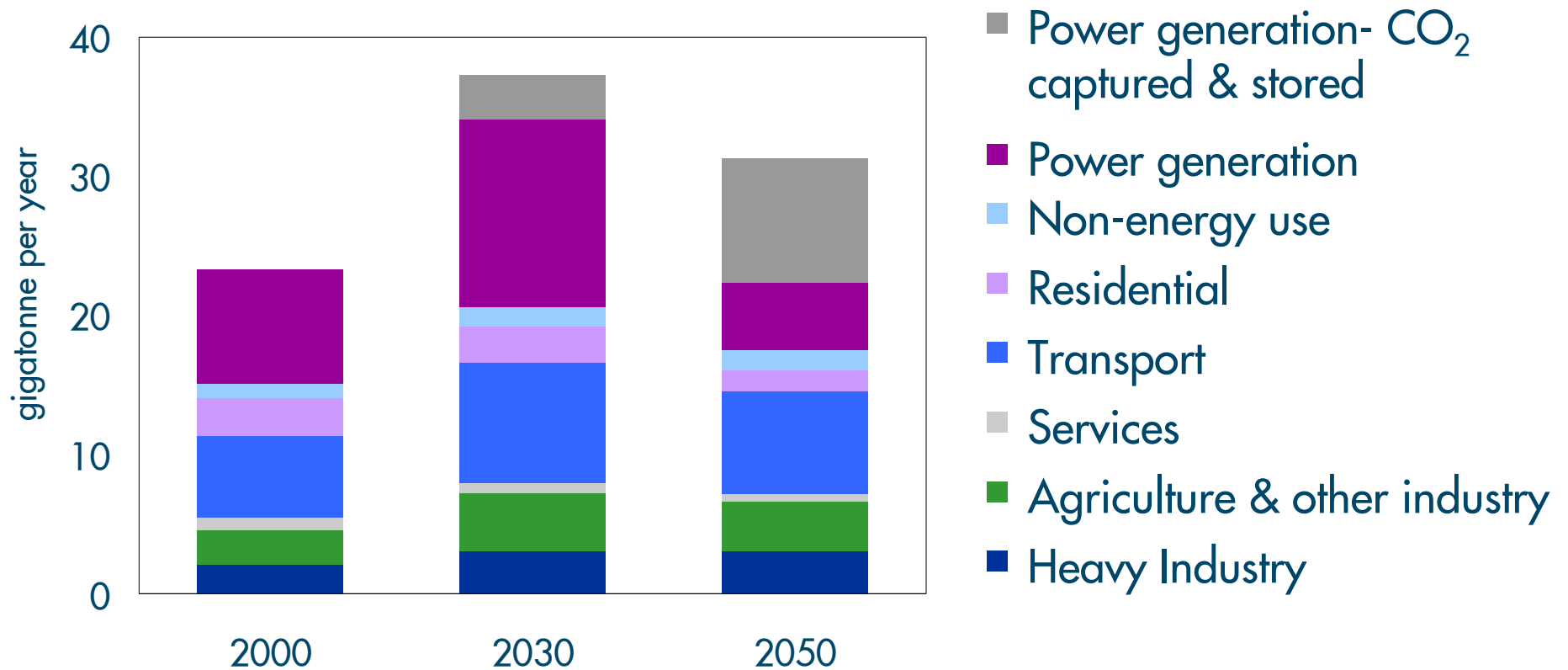
World- final energy consumption by sector



Source: Shell International BV and Energy Balances of OECD and Non-OECD Countries©OECD/IEA 2006

Blueprints – CO₂ capture and storage in power abates ~30% total emissions by 2050

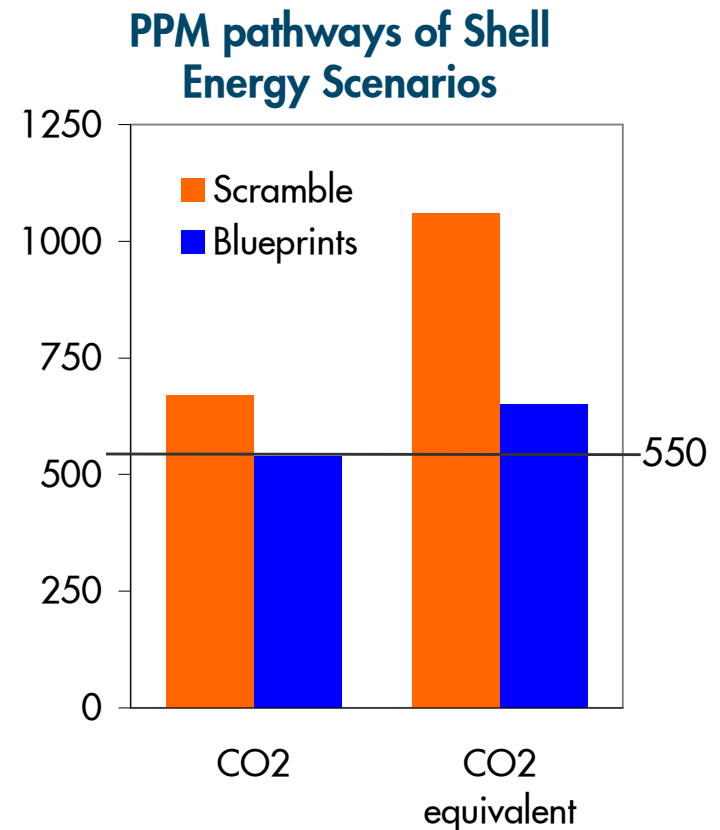
Direct CO₂ emissions from energy by sector



The Blueprints' scenario highlights that much more has to be done

Using the outputs of the Shell energy scenarios in conjunction with the MIT models indicates the following pathways and illustrates how critical non-energy GHGs are

- Blueprints stabilises at a pathway of 650 ppm CO₂e (540 ppm CO₂)
- Scramble is over 1000 ppm CO₂e (670 ppm CO₂), and rising, at end of the century
- Scramble's CO₂e ppm is 60% higher than its CO₂-only ppm. In Blueprints it is only 20%



Pathways include emissions from energy and non-energy sources; CO₂ equivalent (CO₂e) includes all GHGs not only CO₂

In summary – what we have learned



- 🌐 The three hard truths are **very** hard
- 🌐 Transition is both inevitable and necessary
- 🌐 Technology plays a major role, but no silver bullets
- 🌐 Political and regulatory choices are pivotal
- 🌐 The next 5 years are critical

Tackling all three hard truths TOGETHER is essential for a sustainable future

For more information, please visit
<http://www.shell.com/scenarios>

