



The transport fuels mosaic: Fuelling future mobility

20 June 2012



NAME REDACTED

DEMAND FOR MOBILITY WILL INCREASE RAPIDLY

- Transport accounts for a quarter of global energy use and energy-related CO₂ emissions

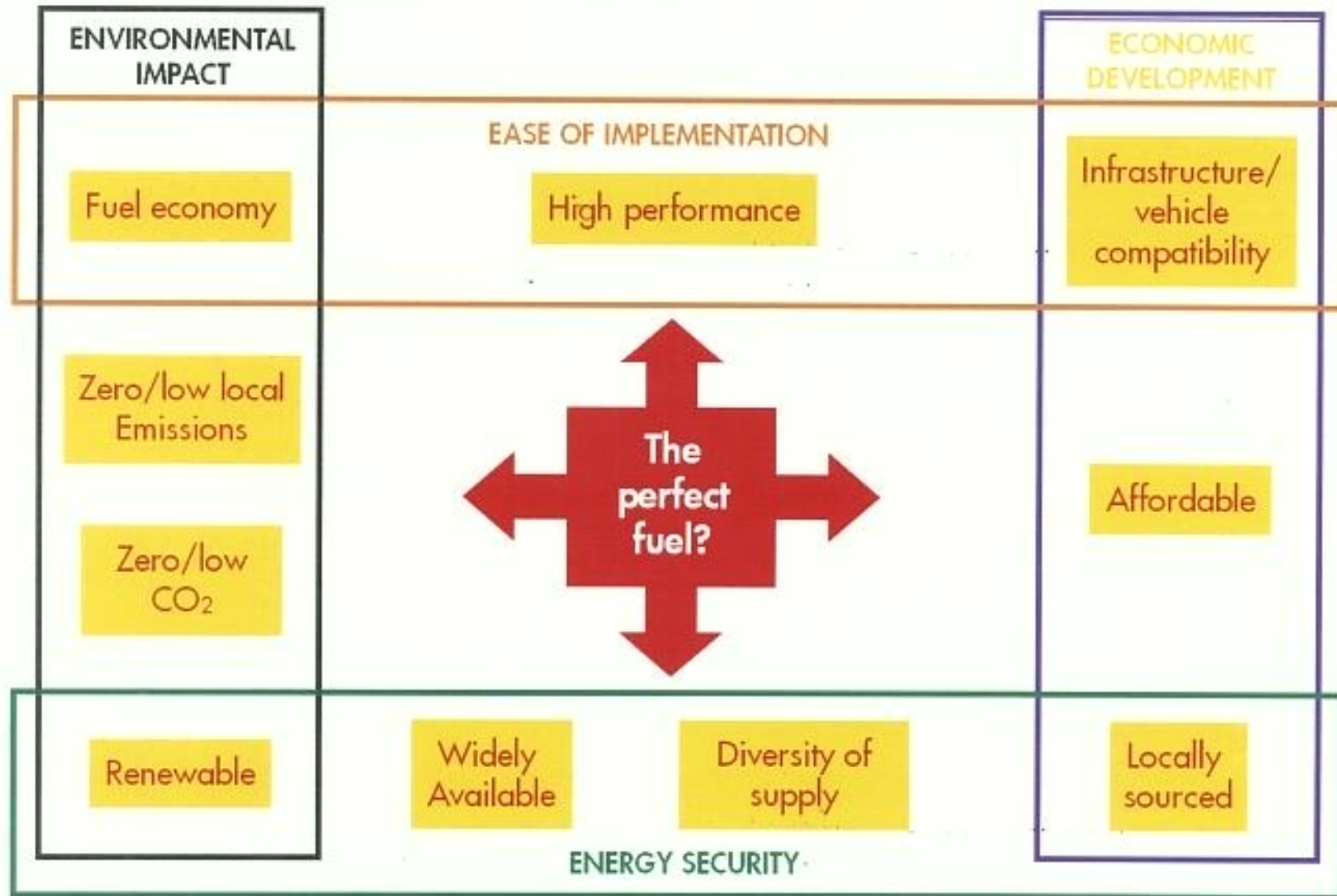


Global
population
could reach
9bn
by 2050

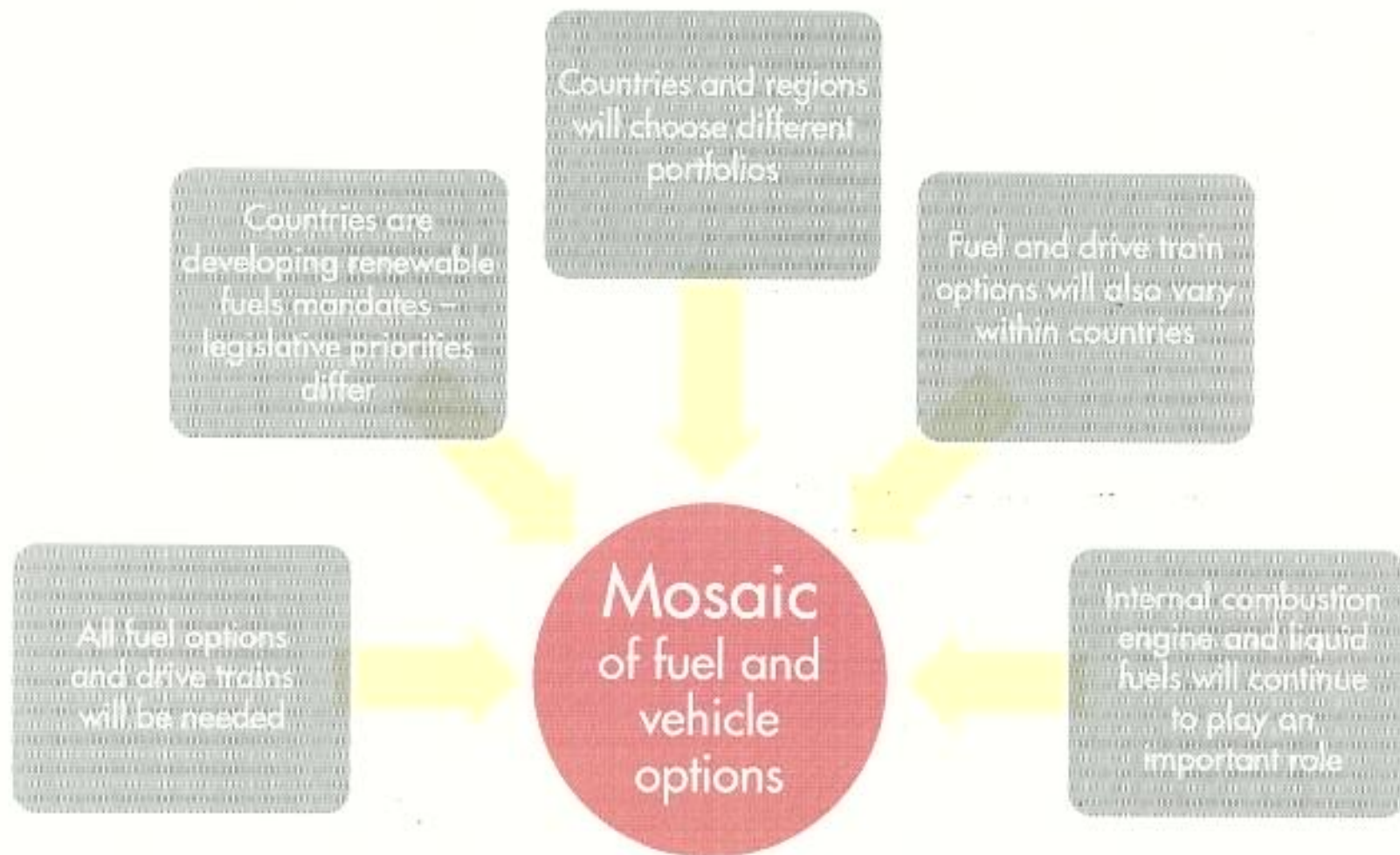
Demand for
mobility
could
triple

Road
transport
CO₂
emissions
could
increase
up to
80%

DEMANDS OF FUELS



NO SINGLE ALTERNATIVE TO OIL BASED ROAD TRANSPORT



SHELL AND BIOFUELS: BUILDING CAPACITY



Challenges for biofuels

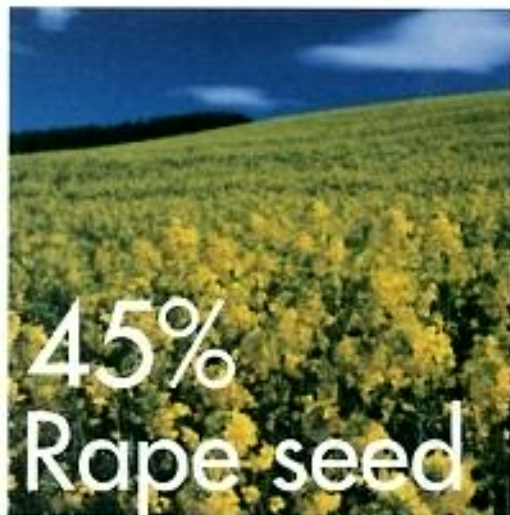
Champion sustainability standards in our own biofuels supply chain



Purchasing certified biofuels where possible

Working with industry, governments and NGOs to raise standards

NOT ALL BIOFUELS ARE THE SAME



SHELL COSAN JOINT VENTURE (Raízen)



Shell's first
move into the
production of
conventional
biofuels

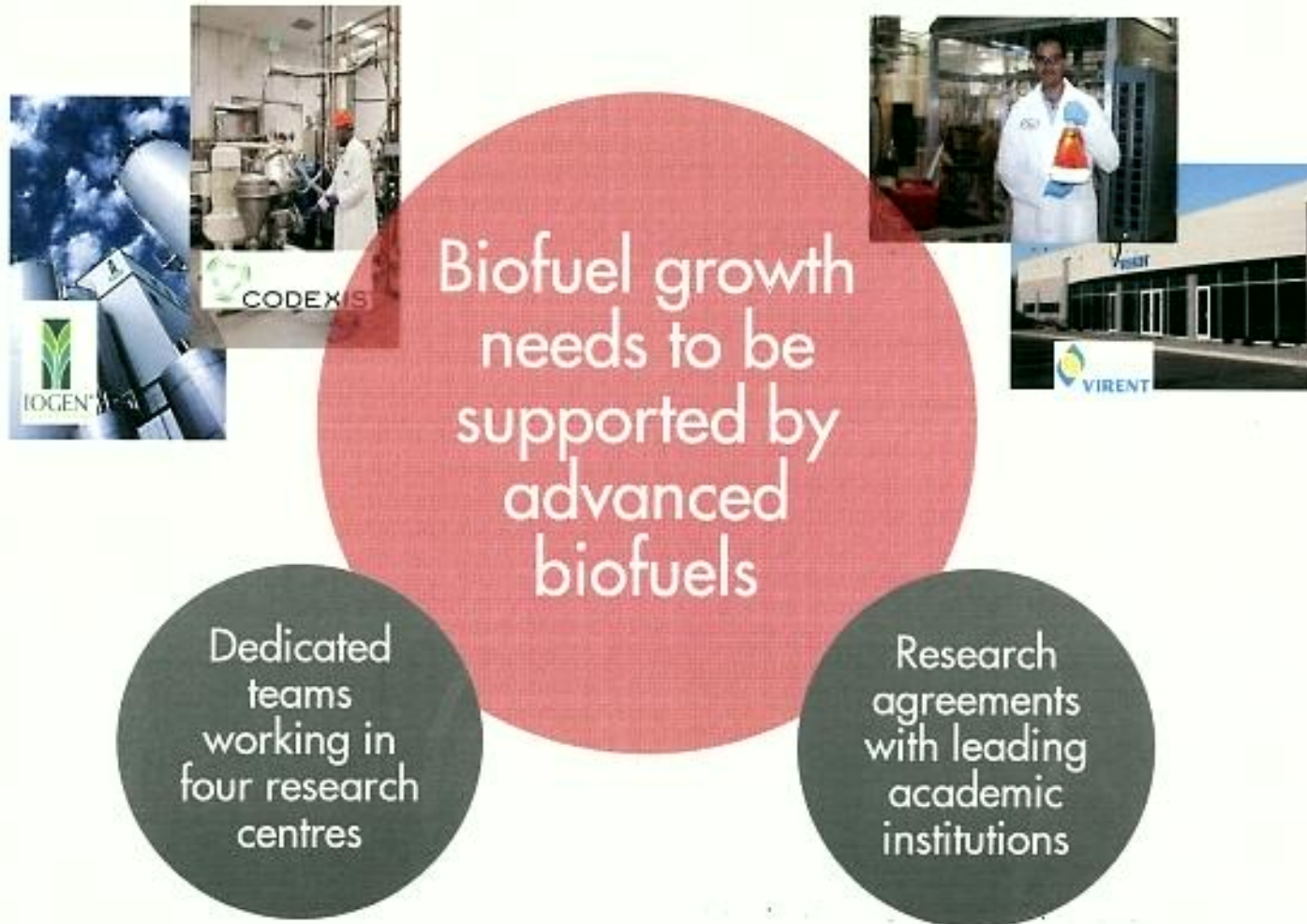
Brazil - most
efficient
ethanol
producing
country

Brazilian sugar
cane - lowest
CO₂,
sustainable, cost
competitive

2 billion +
litres
production
capacity per
year



ADVANCED BIOFUELS WILL BE NEEDED



VIRENT: SUGARS TO HYDROCARBONS



- Joint technology development programme to convert plant sugars and cellulose directly in to liquid transport fuels using catalysts
- Fuels don't require specialised infrastructure, new engine designs or blending equipment

- Pilot plant began production of biogasoline in November 2009



ADVANCED PORTFOLIO: RISK AND OPPORTUNITY

- Technical
- Economic
- Commercial
- Organisational
- Political



GAS IN TRANSPORT



Contribute to
diversification of
diesel fuel supply

Cleaner burning than
conventional diesel

Could help improve
local air quality

GTL gasoil requires
the same vehicles
and infrastructure



HYDROGEN FOR TRANSPORT



Important role as an option to diversify road transport fuel
Hydrogen is used in hydrogen fuel cell vehicles

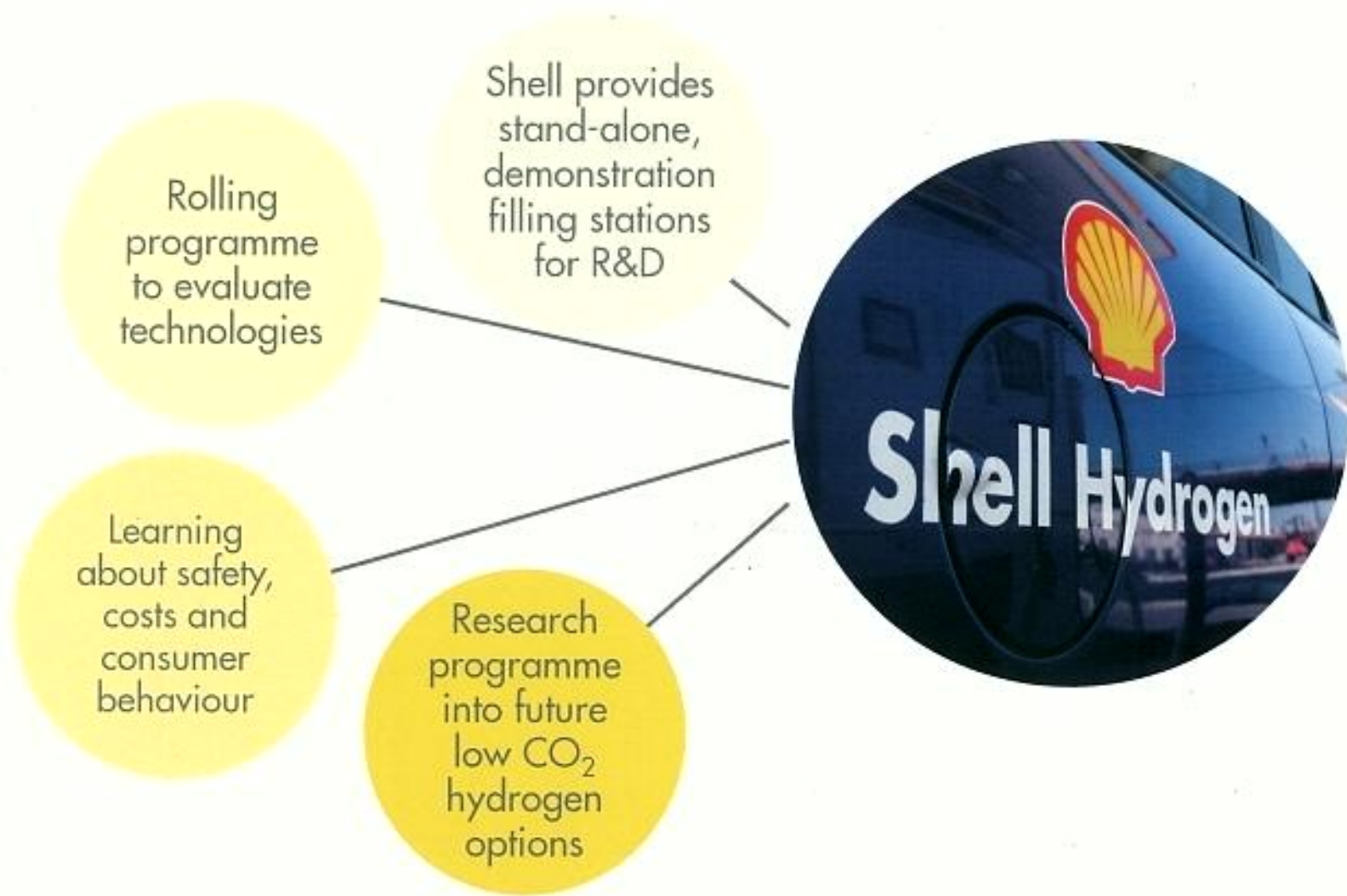


CO₂ benefit depends on how the hydrogen is produced
95% of hydrogen is currently produced from natural gas or gasifying coal



Requires new infrastructure
Industry cannot fund commercialisation
Government facilitated initiatives required to overcome market failure

DEVELOPING THE INFRASTRUCTURE



THE FUTURE IS COLLABORATION



Commercial progress requires cooperation

Shell is involved in H2 Mobility in Germany

Policy and funding mechanisms will accelerate development



ELECTRIC MOBILITY



- Electric vehicles offer the potential to reduce CO₂ emissions from road transport **beyond 2025**
- The overall CO₂ intensity depends on **how the electricity is generated**
- Shell is continuously **reviewing role** in electric mobility

Shell in the UK

- Shell has a sole off take agreement with Ensus – which was Europe's largest biofuels plant and at the time of build, Europe's largest bio investment
- Shell has partnerships with numerous UK universities from Manchester to Oxford and Cambridge to develop biofuels R&D
- Shell supplies E5 and B7 fuels through its retail network
- Shell Trading sources sustainable biofuels for the UK market

Challenges for transport in the UK

- Introduction of E10
- Pathway to higher bioblends to meet the RED targets
- Further development of sustainability criteria
- Policy which influences all the actors (OEMs, retailers, suppliers)
- ILUC decision from the commission and our ability to meet targets
- Support for advanced biofuels /timeline for introduction of advanced biofuels
- Infrastructure to support emerging technologies
- Competition for feedstocks

QUESTIONS?

