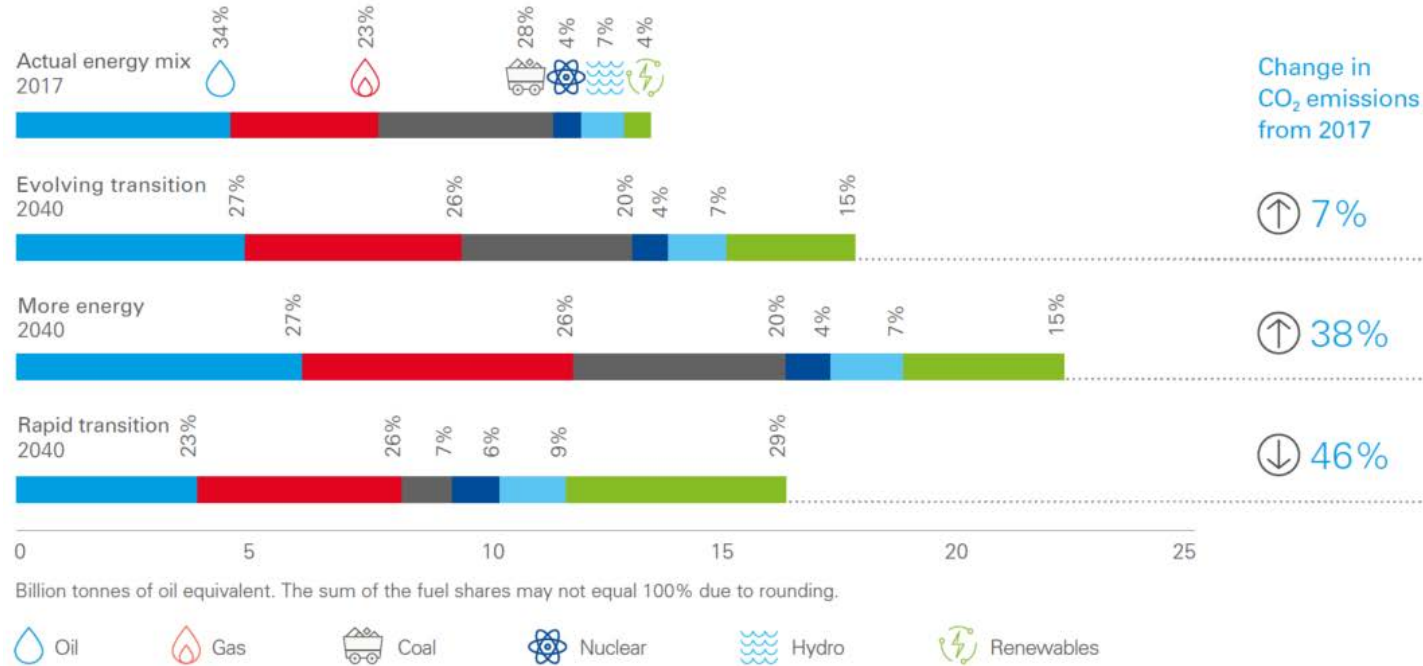


2040 Projections



Energy consumption – 2040 projections



Evolving transition

This scenario assumes that government policies, technology and social preferences continue to evolve in a manner and speed seen over the recent past.

More energy

This scenario sees more countries with energy consumption per person closer to levels in advanced economies.

Rapid transition

This scenario is consistent with the Paris goals and is broadly similar to the reduction in carbon emissions in the IEA's Sustainable Development Scenario.

See bp.com/energyoutlook for more information on our projections of future energy trends and factors that could affect them out to 2040.

Biojet



Used cooking oil is collected



The used oil is converted to synthetic jet fuel



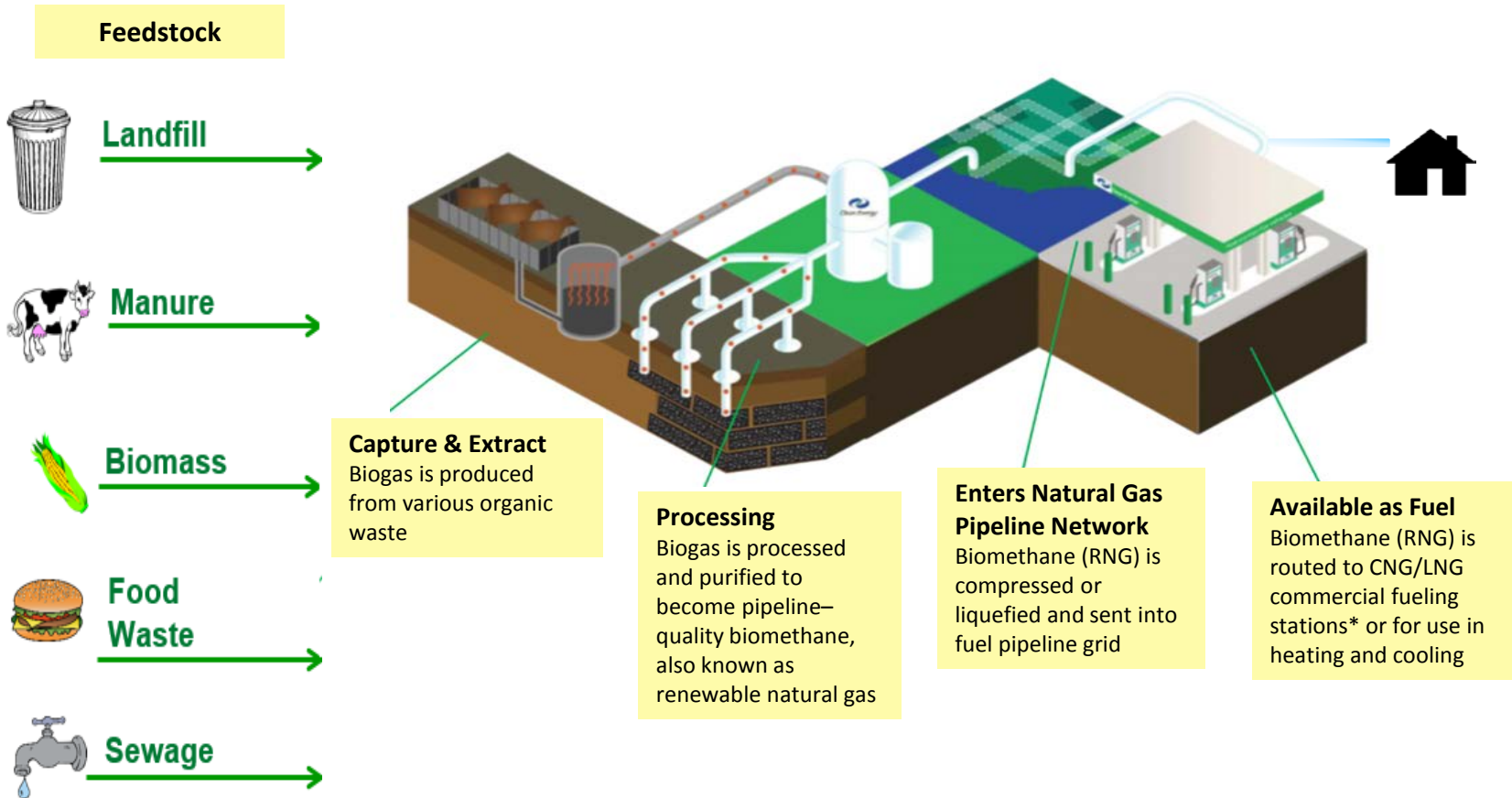
Synthetic jet fuel is blended with standard aviation fuel to make it suitable for aircraft



Biojet fuel is delivered to airport and into aircraft



What is Biogas?



* Biogas is a competitive, renewable alternative to conventional fuels. As a vehicle fuel it provides an opportunity to generate RINS under the EPA RFS program and LCFS credits under CARB's LCFS program.

What are the options for compliance?

BP will continue to work with our customers to supply safe, compliant and quality fuels globally.

VLSFO

VLSFO will be a new fuel option available in 2020

- As most VLSFO available will be blended, stability and compatibility will be key considerations.
- Economic incentives are expected to drive increased use of VLSFO over time.

MGO

The most familiar fuel option, MGO is widely available and operationally tested.

- No fuel switching will be required. MGO can be used globally both inside and outside ports.
- As a distillate component, MGO is likely to be the most expensive option, with additional lubricant requirements.

LNG

LNG fuel systems require specialist crew and we expect their use to be limited to new build vessels due to the expense of retrofitting

- Infrastructure for LNG bunkering will be less established than for other fuel types in 2020.
- LNG has low NOx and SOx emissions.

HSFO

Scrubbers can be fitted to remove sulphur from exhaust gases and enable vessels to burn cheaper high sulphur fuels.

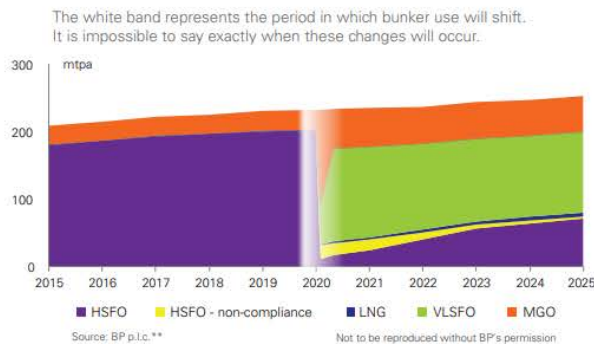
- Scrubber installation time and cost has resulted in limited adoption so far.
- Advances in technology are expected to make scrubbers an increasingly attractive solution.



The marine fuels market transition

The implementation of MARPOL 2020 will see the marine fuels landscape change significantly. Over 95% of the current market will be displaced.

Vessel owners will have several options when selecting compliant marine fuels under MARPOL 2020.



MGO MGO will account for the majority of marine fuel use as MARPOL 2020 comes into effect. It requires no investment and no new operating procedures.

LNG Uptake of LNG as bunkers is likely to be confined to specialist sectors and geographies as LNG fuel systems are high in cost, can reduce vessel cargo capacity and require particular operating skills.

HSFO HSFO use declines significantly around the turn of 2020, with only limited use on vessels fitted with scrubbers.

Scrubber installations are forecast to grow steadily from a low base in 2020. Although retrofit is often possible, inclusion of scrubbers at the new build design stage is more economically efficient.

VLSFO The price differential between MGO and VLSFO will incentivize a shift towards VLSFO products. The market is forecast to use over 50% VLSFO fuels after January 2020.

HSFO: High sulphur fuel oil
VLSFO: Very low sulphur fuel oil
MGO: Marine gas oil
LNG: Liquefied natural gas
NOx: Nitrogen oxides
SOx: Sulphur oxides

