

# ENERGY TRANSITION GLOBAL TRENDS & LESSON LEARN

HARI LISTRIK NASIONAL  
10 OKTOBER 2019



# AGENDA

1

**ENERGY TRANSITION NEEDS**

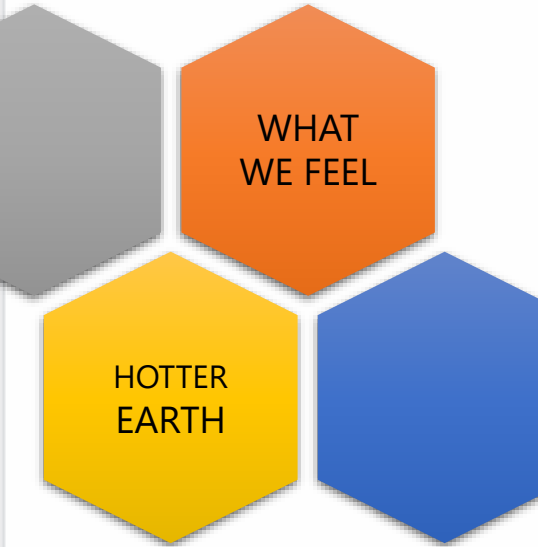
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**ENERGY TRANSITION GLOBAL TREND**

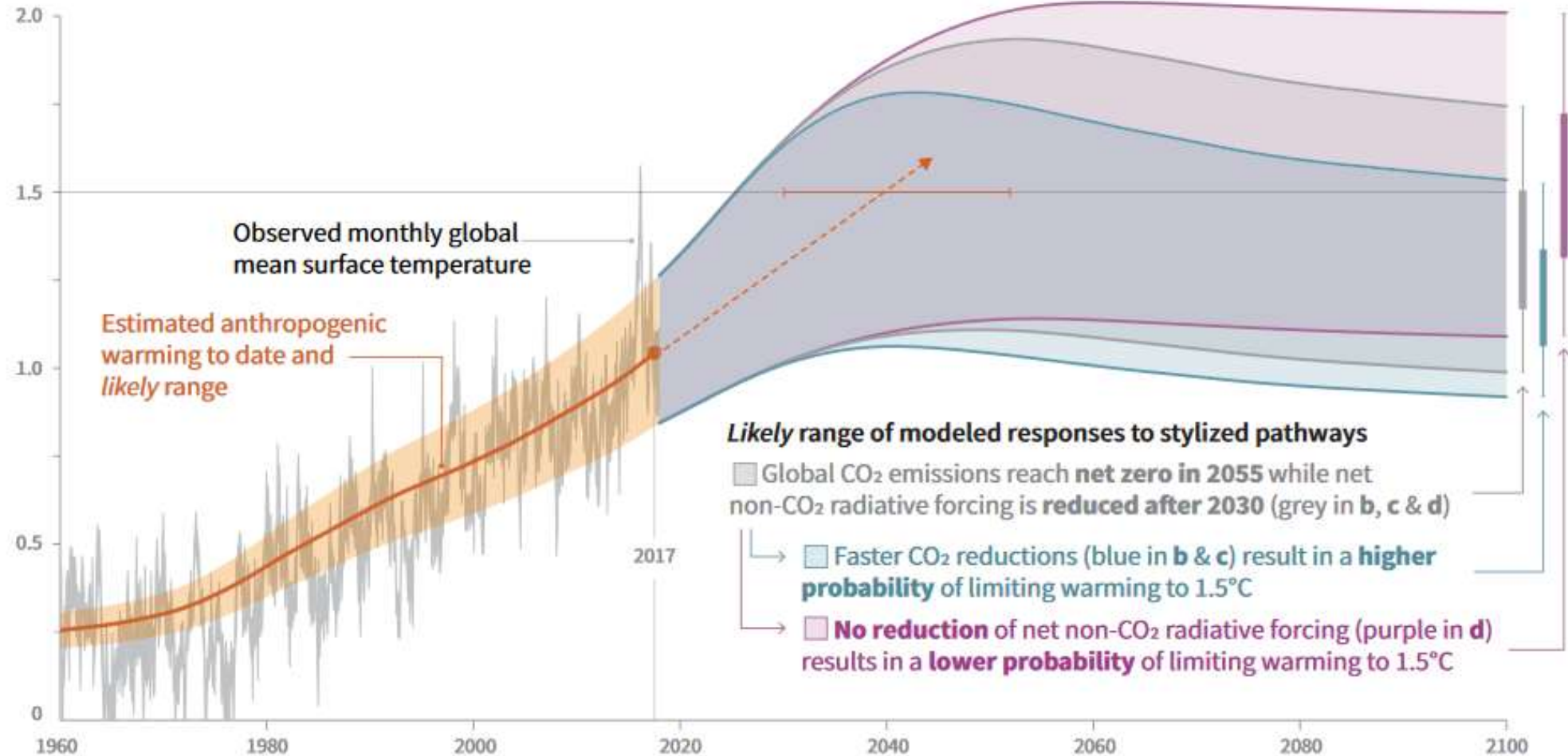
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**LESSON LEARN FOR INDONESIA**

# WHAT WE FEEL



Global warming relative to 1850-1900 (°C)



Adapted from :  
IPCC, Intergovernmental Panel  
of Climate Change, Global  
warming of 1.5°C

# IMPACT



https://www.thesun.co.uk/tech/8930191/global-warming-damage-heat-arctic-permafrost/

Citrix Receiver Absensi Prolakfe IP KMS ERP ProDCS2.0 EvaluasiDiklat L1 IRMA Dashboard PMO DosenSTT ManOH

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## CLIMATE CALAMITY Global warming threatens to cause £54TRILLION in damage as heat melts Arctic permafrost

A large amount of greenhouse gases will be released from the melting permafrost

Charlotte Edwards  
24 Apr 2019, 16:52 | Updated: 24 Apr 2019, 16:55

12 COMMENTS

MELTING sea ice and permafrost could cost the world £54trillion, according to the world's most advanced economic study on the cost of



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https://www.nationalgeographic.com/environment/global-warming/global-warming-effects/#/05-global-warming-gallery.jpg

Teras - Home SimKPNAS ProDIN 3.0 Citrix Receiver Absensi Prolakfe IP KMS ERP ProDCS2.0 EvaluasiDiklat L1 IRMA Dashboard PMO DosenSTT ManOH SmartBali ETMC


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In the high plains of Bolivia, a man surveys the baked remains of what was the country's second largest lake, Lake Poopó. Drought and management issues have caused the lake to dry up.

PHOTOGRAPH BY MAURICIO LIMA, NAT GEO IMAGE COLLECTION

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https://www.nationalgeographic.com/environment/global-warming/global-warming-effects/#/06-global-warming-gallery.jpg

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< CLOSE CAPTION


Climate change is impacting flora and fauna across the Arctic. Although scientists don't know specifically what killed this individual polar bear, experts warn that many of the bears are having trouble finding food as the sea ice they historically relied on thins and melts earlier.

PHOTOGRAPH BY CRISTINA MITTERMEIER, NAT GEO IMAGE COLLECTION

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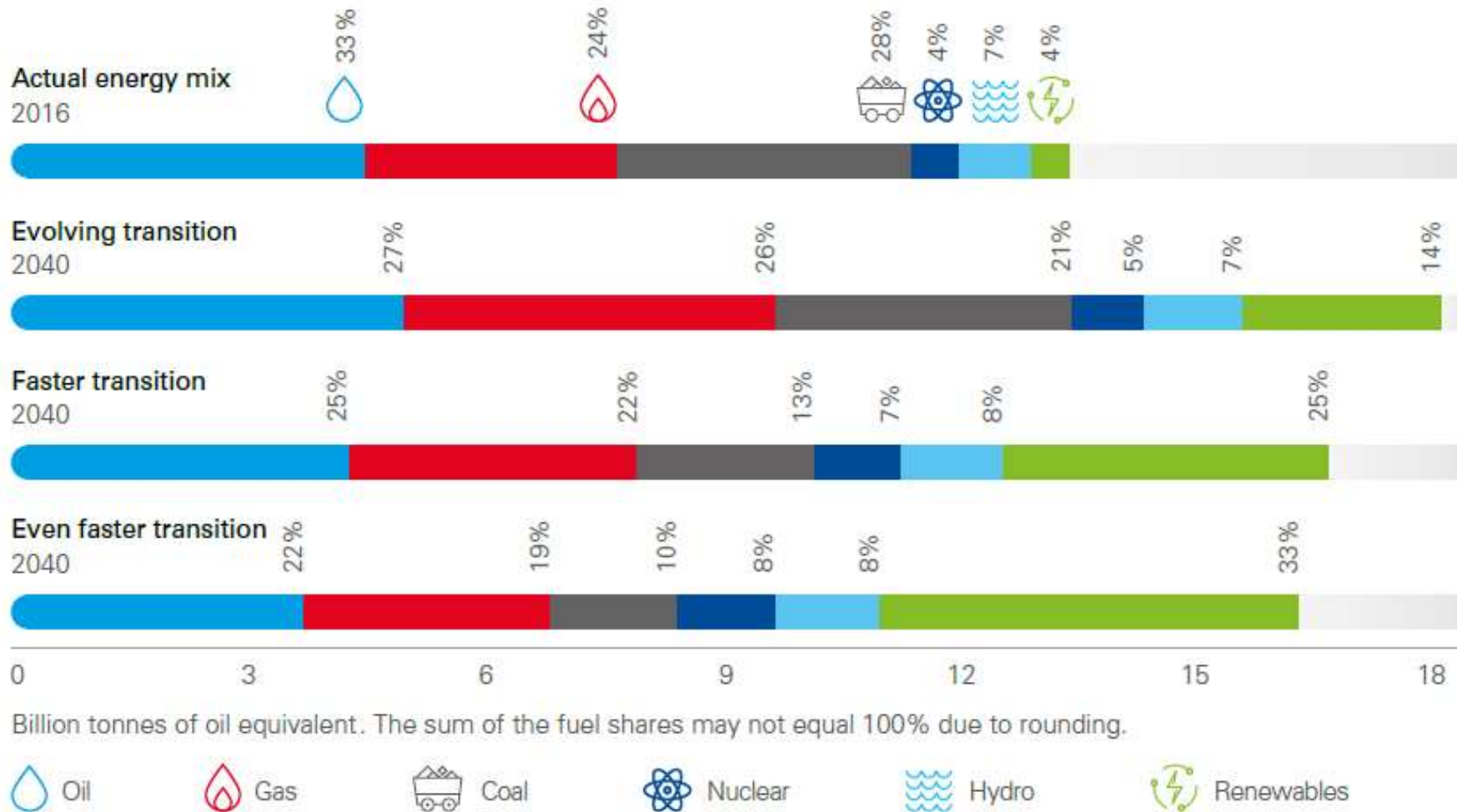
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# ENERGY CONSUMPTION-PROJECTION 2040



## Evolving transition

In this scenario, government policies, technology and social preferences evolve in a manner and speed seen in the recent past. The growing world economy requires more energy but consumption increases less quickly than in the past.

## Faster transition

This scenario sees carbon prices rising faster than in the evolving transition scenario, with other policy interventions encouraging more rapid energy efficiency gains and fuel switching.

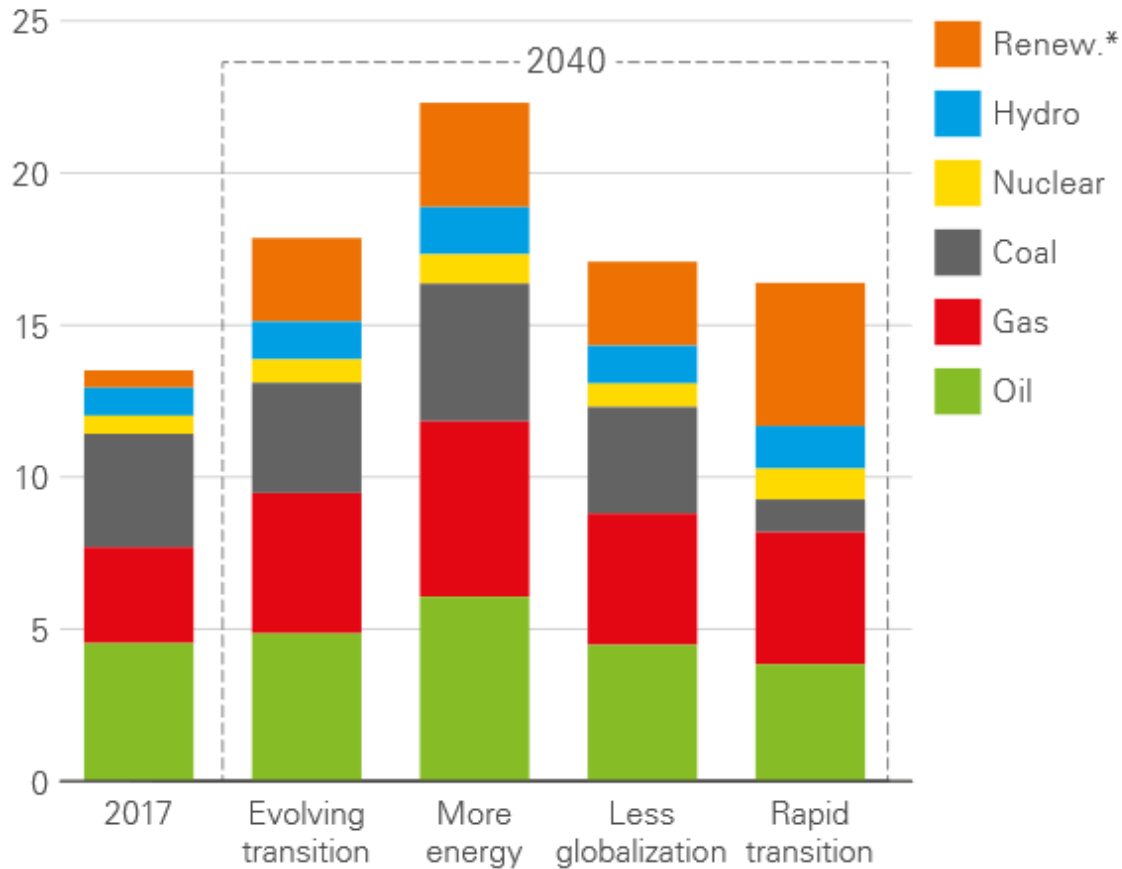
## Even faster transition

This scenario matches carbon emissions similar to the International Energy Agency's sustainable development scenario, which aims to limit the global temperature rise to well below 2°C.

# ENERGY MIX TRANSITION BY FUEL AND CO2 EMISSION

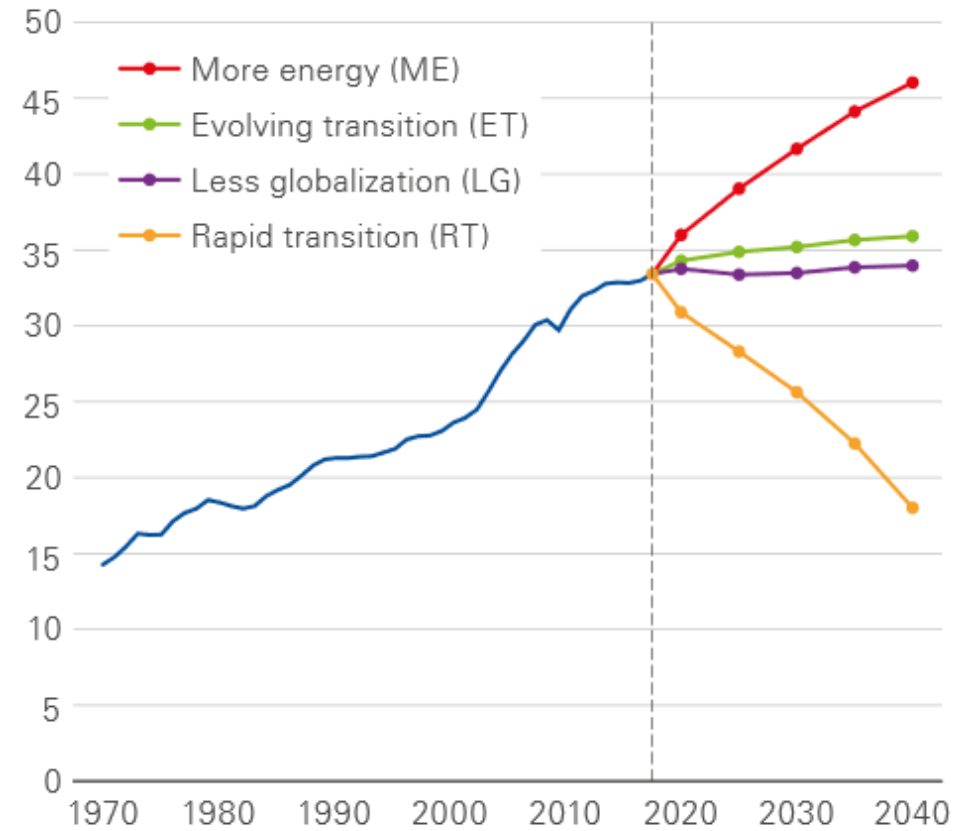
Primary energy consumption by fuel

Billion toe



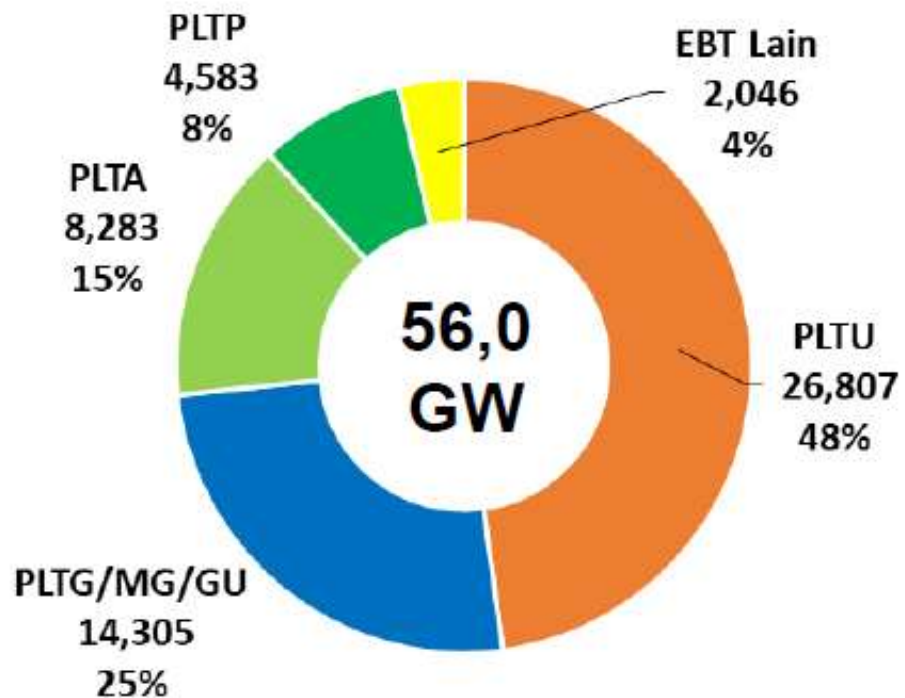
CO<sub>2</sub> emissions

Gt of CO<sub>2</sub>



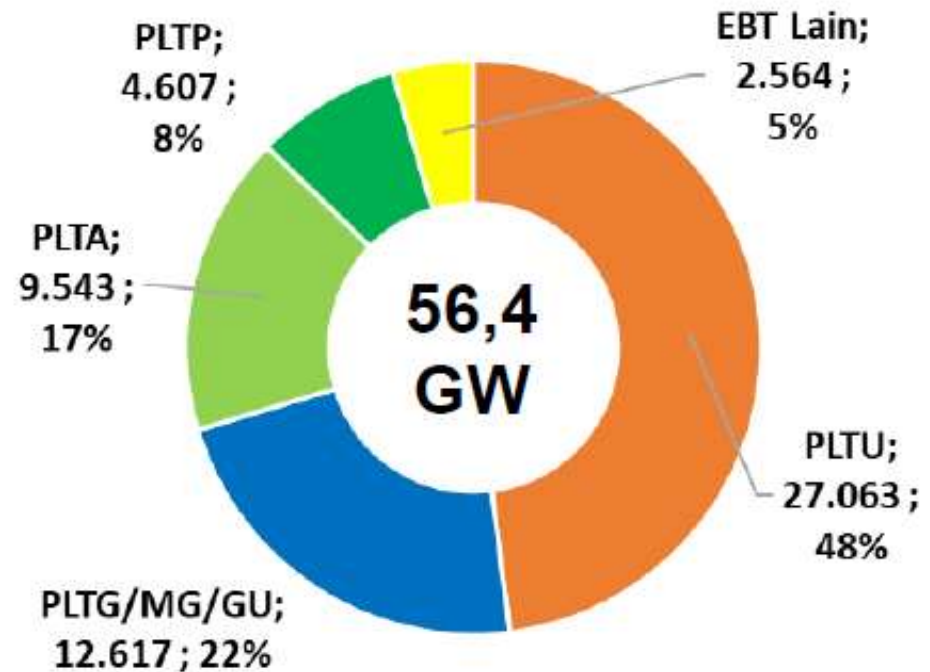


# INDONESIA ENERGY MIX



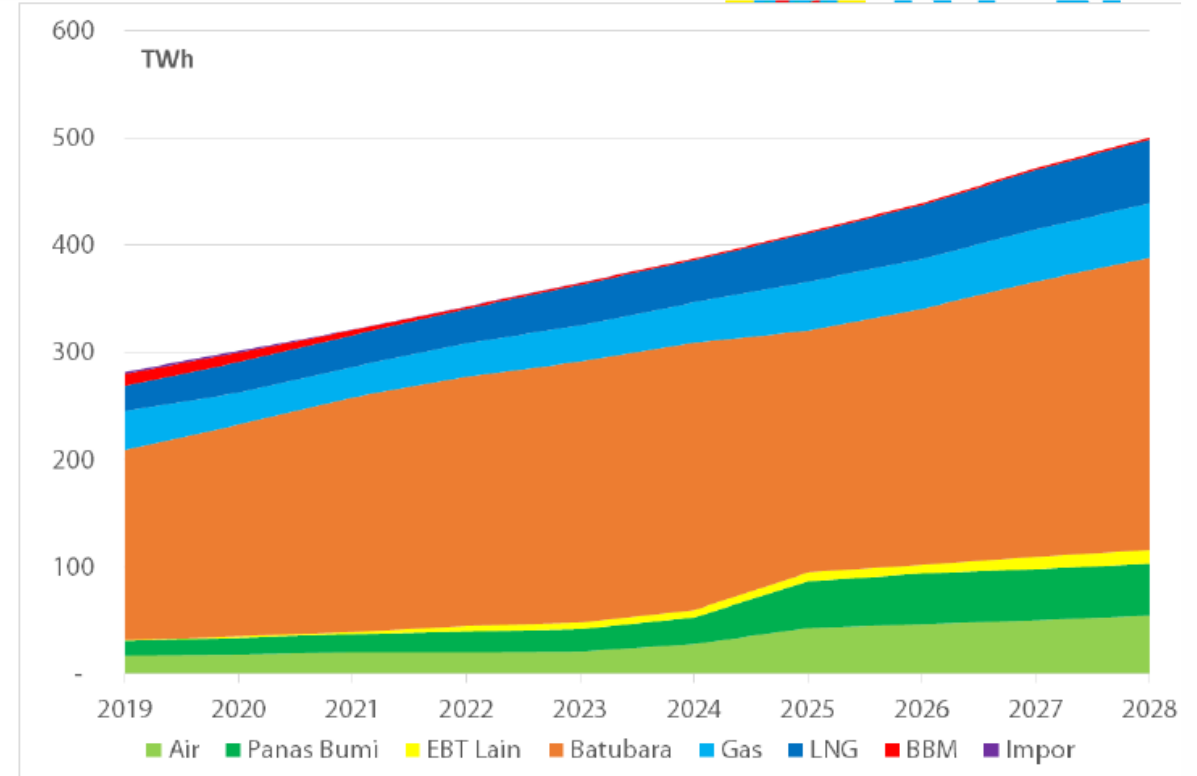
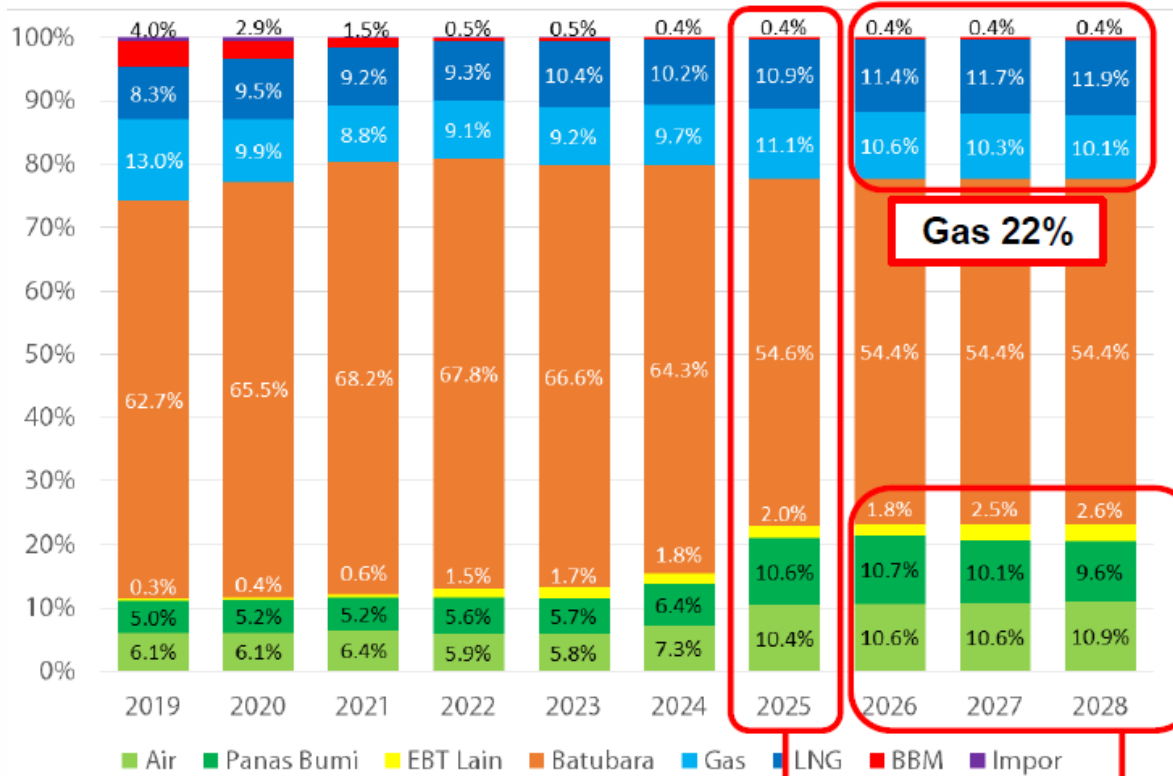
RUPTL 2018-2027

Total Penambahan Kapasitas EBT: 30%



RUPTL 2019-2028

# ENERGY MIX PROJECTION IN INDONESIA



| Jenis    | RUPTL 2018-2027 | RUPTL 2019-2028 |
|----------|-----------------|-----------------|
| EBT      | 23,0%           | 23,0%           |
| Gas      | 22,2%           | 22,0%           |
| Batubara | 54,4%           | 54,6%           |
| BBM      | 0,4%            | 0,4%            |
| Jumlah   | 100%            | 100%            |

Target Bauran Energi Tahun 2025

EBT 23,2%

- Untuk menjaga bauran energi EBT 23,2% pada 2026-2028, diperlukan penambahan PLTS atap (PV rooftop) sekitar 3.200 MW (setara 1,6 juta pelanggan PLTS atap @ 2 kW).
- Target tersebut dapat tercapai dengan partisipasi masyarakat dan dukungan Pemerintah dalam pengembangan EBT, terutama PV rooftop yang harganya diperkirakan akan semakin menurun di masa depan.

# ETI: TRANSITION READINESS ENABLING DIMENSIONS

World Energy Forum, provides ETI (Energy Transition Index), spanning many dimensions of energy transition performance and enablers. Designed to track country-level energy transitions.



| Country name      | 2019 ETI Score <sup>a</sup> |
|-------------------|-----------------------------|
| 1. Sweden         | 75%                         |
| 2. Switzerland    | 74%                         |
| 3. Norway         | 73%                         |
| 4. Finland        | 73%                         |
| 5. Denmark        | 72%                         |
| 6. Austria        | 71%                         |
| 7. United Kingdom | 70%                         |
| 8. France         | 69%                         |
| 9. Netherlands    | 69%                         |
| 10. Iceland       | 69%                         |
| 13. Singapore     | 67%                         |
| 31. Malaysia      | 63%                         |
| 51. Thailand      | 57%                         |
| 55. Vietnam       | 55%                         |
| 59. Philippine    | 55%                         |
| 63. Indonesia     | 55%                         |

# LESSON LEARN-COUNTRY WIDE

Energy system structure

✓ Better energy mix

Institution & governance

✓ Governance, Risk & Compliance strengthening

Capital & investment

✓ Incentive on Renewables

Human capital & customer participation

✓ Human Capital Development on industrial 4.0 based on renewables technology

Regulation & political commitment

✓ Flexible Regulation

Infrastructure & innovative business environment

✓ Business environment friendly

# LESSON LEARN-FUTURE STEP

## ENERGY PRODUCER PERSPECTIVE

### Optimizing process heat

Digital technologies are helping us to reduce energy by improving how we heat seawater for use at our Deepwater Gunashli platform in Azerbaijan.

### Reducing fuel consumption

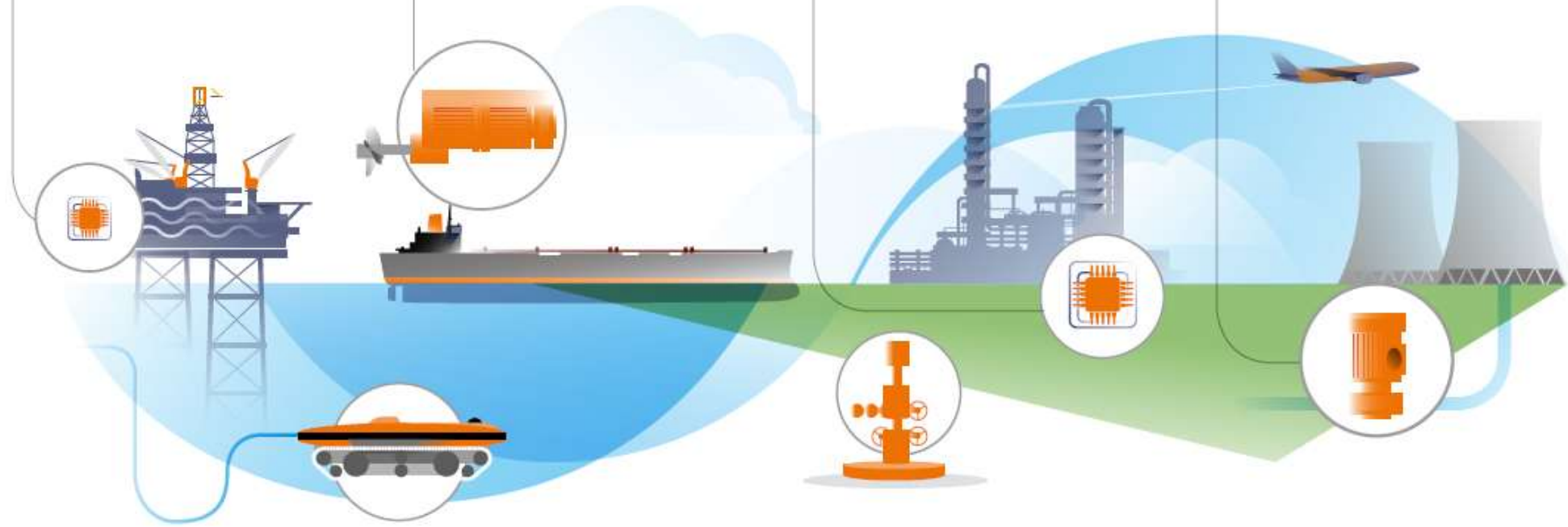
We've introduced oil tankers with more efficient engines and advanced energy management systems.

### Retrofitting technology

We upgraded technology at our Cooper River petrochemicals plant in the US, which will significantly reduce the site's energy use and emissions.

### Using co-generated power

We now use electricity from our co-generation facility to power the turbines used to pump water to the cooling tower at our Whiting refinery in the US.



BP CASE

Adapted from :  
BP Advancing energy transition

# LESSON LEARN-FUTURE STEP

## CONSUMER PERSPECTIVE

## BP CASE

Adapted from :  
BP Advancing energy transition

### Carbon neutral lubricants

Our *Castrol Professional* lubricants – supplied to car dealerships for use in servicing cars – are certified as carbon neutral in accordance with PAS 2060.

### Reducing plastic in packaging

In the US, we've redesigned some of our *Castrol* engine oil packaging to use less plastic, resulting in a reduction in CO<sub>2</sub> emissions of about 2,000 tonnes a year.

### Lower carbon chemicals

Our *PTAir*, used to make items such as clothes and plastic food packaging, has a carbon footprint almost 30% lower than the average European PTA. We are also assessing technologies for producing renewable and recycled PTA.

### Supplying biofuel to airports

We make jet biofuel available using existing fuelling infrastructure at Oslo and Bergen in Norway and Halmstad in Sweden.



### Working with vehicle manufacturers

In Europe, Ford's EcoBoost engines are engineered with advanced *Castrol* oils, to help improve fuel efficiency.

### Renewable gas from food and agricultural waste

We are the largest producer of renewable gas fuel for US transport. This fuel can reduce greenhouse gas emissions by around 70% compared with gasoline or diesel-fuelled vehicles.

### Offsetting emissions with our fuel cards

Customers can use our *Aral* and *BP* fuel cards in Austria, Germany, the Netherlands and the UK to offset their carbon emissions.

### Jet fuel made from household waste

We are working with Fulcrum BioEnergy to supply biojet fuel at key hubs across North America.



TERIMA  
KASIH