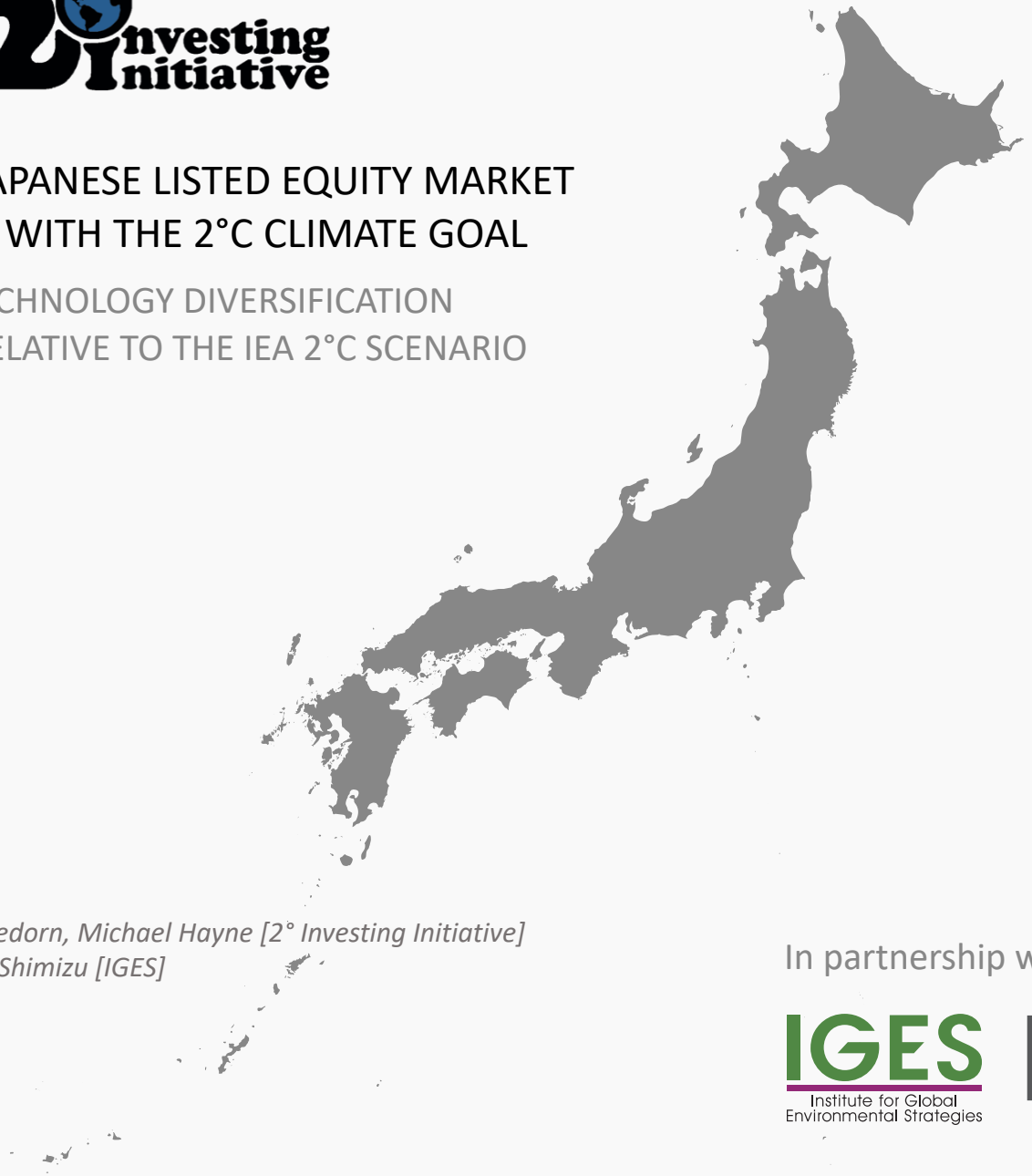
TESTING THE JAPANESE LISTED EQUITY MARKET ALIGNMENT WITH THE 2°C CLIMATE GOAL

ENERGY TECHNOLOGY DIVERSIFICATION ASSESSMENT RELATIVE TO THE IEA 2°C SCENARIO



Authors:
Hugues Chenet, Klaus Hagedorn, Michael Hayne [2° Investing Initiative]
Takako Wakiyama, Noriko Shimizu [IGES]

In partnership with:

IGES Institute for Global Environmental Strategies

RIEF

Outline and expectations

- What 2°C alignment of financial portfolio means
- Framework and methodological approach
- Main results and conclusions

➔ it's an introduction to a new approach

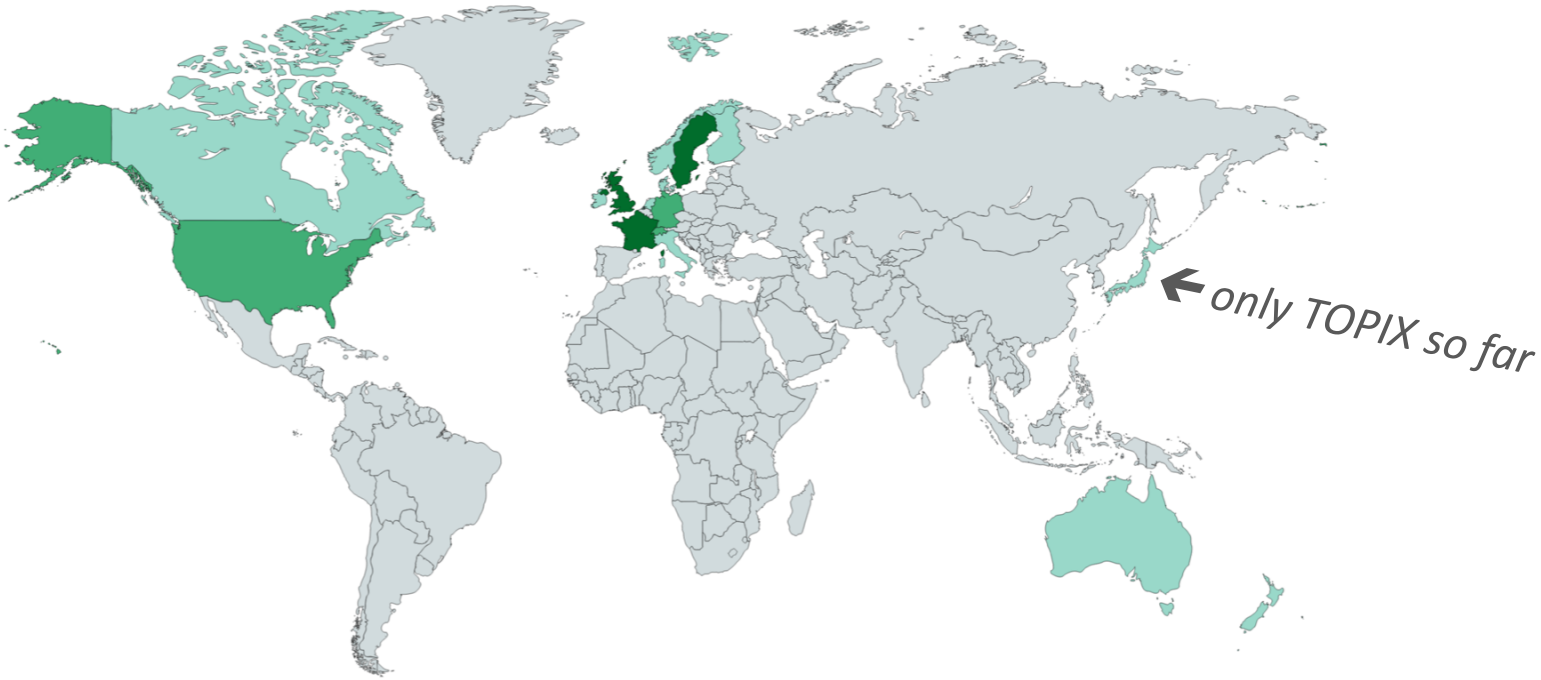
➔ we cannot address all details today

➔ it opens new grounds for collaboration

… please feel free to follow-up with remarks and questions!

2°C alignment of financial portfolios

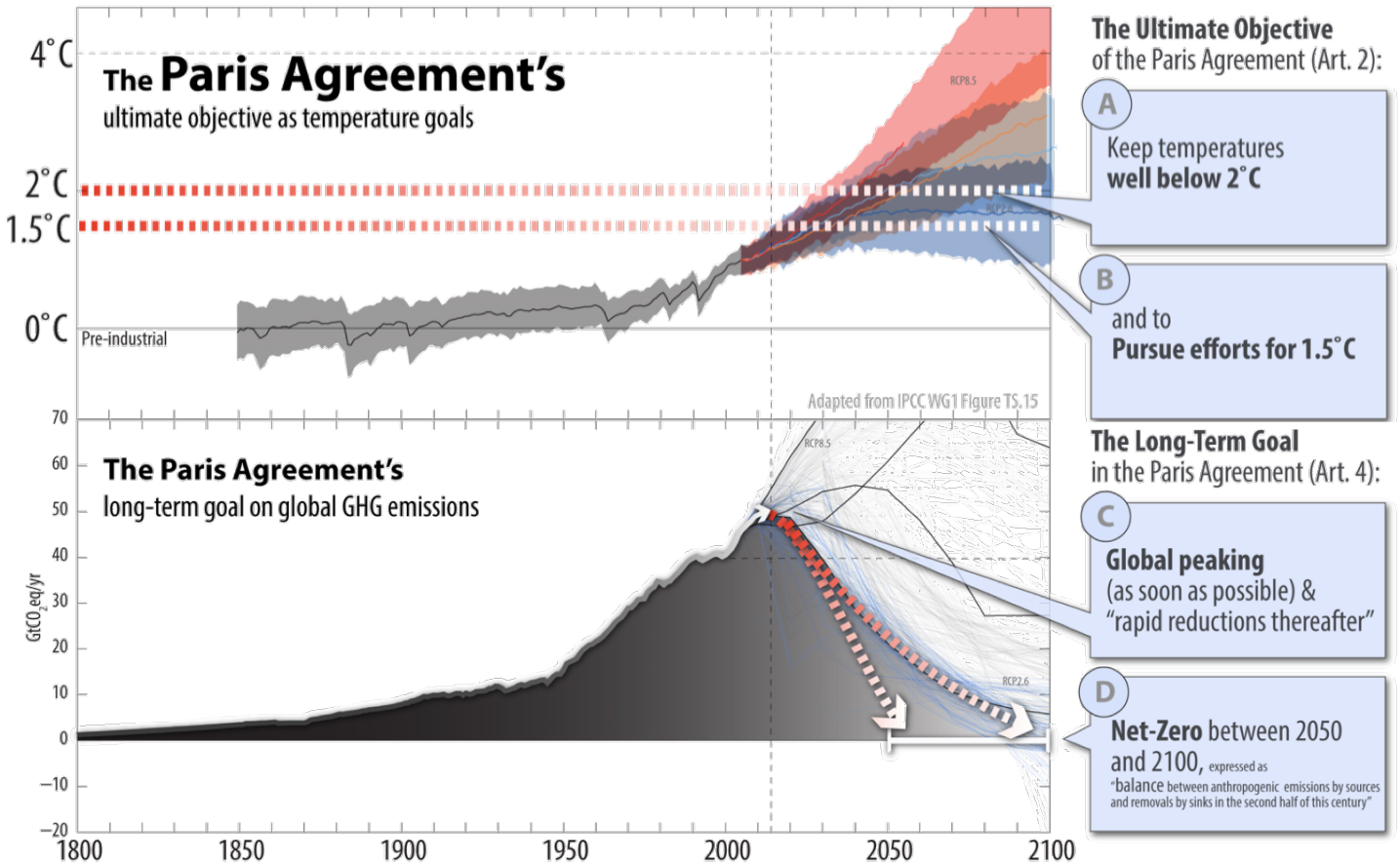
- The methodology we used was developed in the frame of the European project "SEI METRICS" — cf. http://seimetrics.org
- > 200 investors, > 2000 portfolios, > $3 trillion AUM have already been assessed worldwide



Paris Agreement and the <<2°C paradigm

- A clear climate goal

FIG. THE PARIS AGREEMENT IN 2 GRAPHS (SOURCE: MEINSHAUSEN 2015)



Paris Agreement and the role of finance

- A clear climate goal
- A clear role for Finance
  - **Paris Agreement** (UNFCCC, 2015):

*"Making **finance flows consistent with** a pathway towards low GHG emissions and climate-resilient development"*

(Article 2-c)

Framework of the paper 1/2

Question:

- Is the Japanese financial market aligned with the Paris Agreement?
- *(+ is it possible to assess so?)*

We propose to:

- Use the TOPIX to represent the stock market
  - Tokyo Stock Price Index (TOPIX): mainstream stock index composed of ~2000 large-sized companies listed on the Tokyo Stock Exchange
- Compare with IEA scenarios
  - Energy and technology roadmaps compatible with 2°C GHG emission pathways

Framework of the paper 2/2

The results consist in:

- Forward-looking gaps in energy and technology exposures (not GHG!)
- Between the IEA 2°C trajectory and the companies of the TOPIX
- Over a 5-year period (2016-2021)
- For power, automobile and fossil fuels production and capacity

Methodology

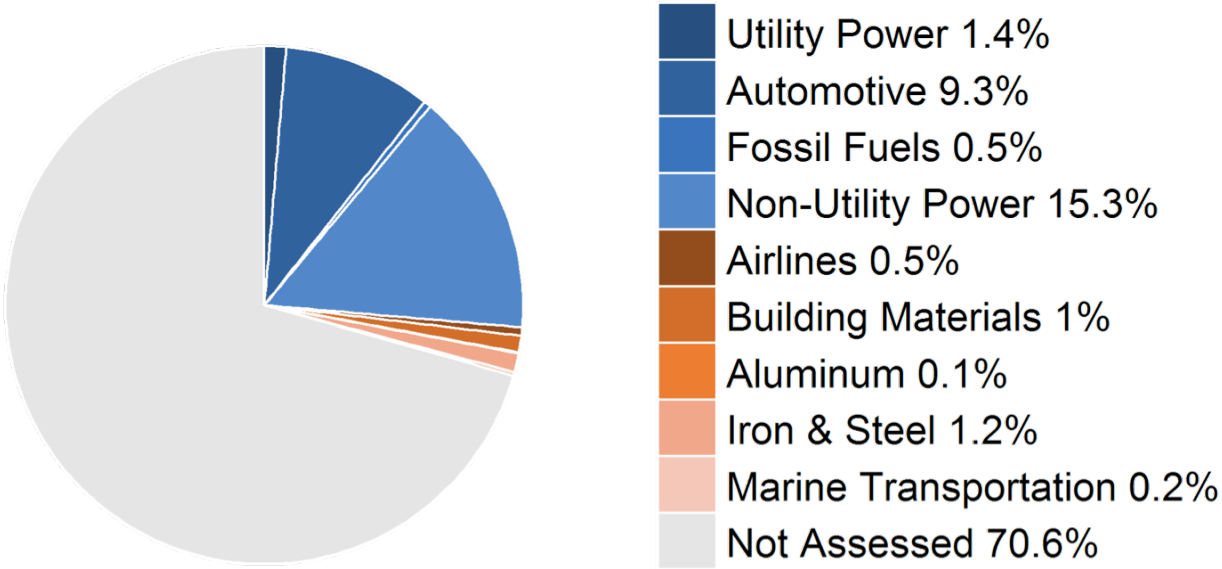
- Timeframe: 5 years (2016-2021)
- Data as of 30 Dec. 2016
- Sector coverage: energy and technology production and capacity
  - Electric power
  - Automobiles
  - Oil, gas, coal

  … regardless of industry classification.
- Translation of sectoral + regional production goals (MW, barrels, m^3, $n_{vehicles}$, …) → production from the Japanese equity universe
- "Fair share logic": allocates future responsibility for production based on their current market share

  → Adds the IEA 2°C production trendline on top of the listed equity starting point

Sector coverage

Figure 1. Coverage of assessment (blue) and potential future coverage (orange) in market capitalisation of the companies listed in TOPIX as of 30 December 2016.



Methodology

- Construction of a production and capacity ‘2°C benchmark’
- Based on a scaling of the IEA 2°C scenario for Japan to the size of the TOPIX
- With specific energy/technology mix based on the current ownership of capacity/production of companies relative to the total listed market
- Comparison with current 2016-2021 production and capacity for TOPIX companies

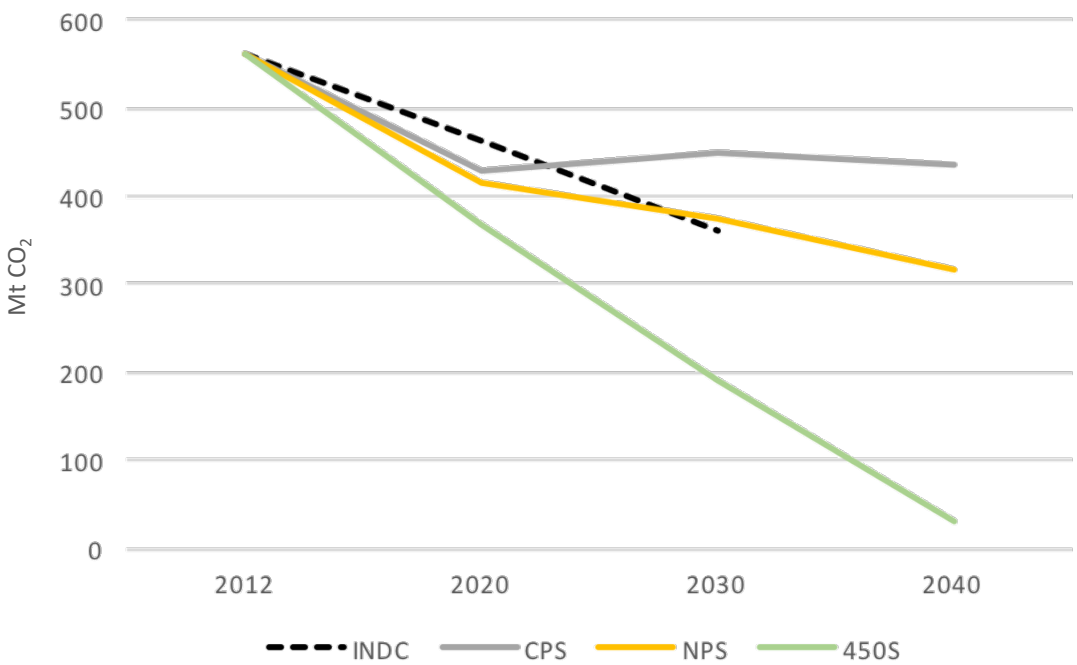
➔ Forward-looking gaps in energy and technology exposures (not GHG!)

Methodology

- 2°C Scenarios
  - International Energy Agency (IEA)
  - → World Energy Outlook (WEO 450)
  - → Energy Technology Perspectives (ETP 2DS)

} *~50% chance of limiting global temperature increase to +2°C*

Figure 3. Power generation related GHG emissions for Japan, for 4 scenarios. *Source: Authors made from IEA (2015b); UNFCCC (2015a).*
[NB: There is no INDC target of 2020, thus the 2020 data of INDC uses linear interpolation from 2012 to 2030.]



Methodology

- Data from industry databases
  - GlobalData
    - Power plant data, including plants classified as active, announced, financed, partially active, permitting, temporarily shut down, under construction, under rehabilitation & modernisation
    - Oil and Gas production data and forecast
  - WardsAuto
    - Light passenger duty vehicle
  - Bloomberg
    - Financial data and coal production data

- Data as of 30 December 2016

Methodology

- "Fair share logic" examples:

For a technology required to increase …

- If a company owns 10% of **total power** capacity in Japan today

→ 10% total renewable power required additions to meet 2°C are allocated to the company (whatever its renewable capacity today)

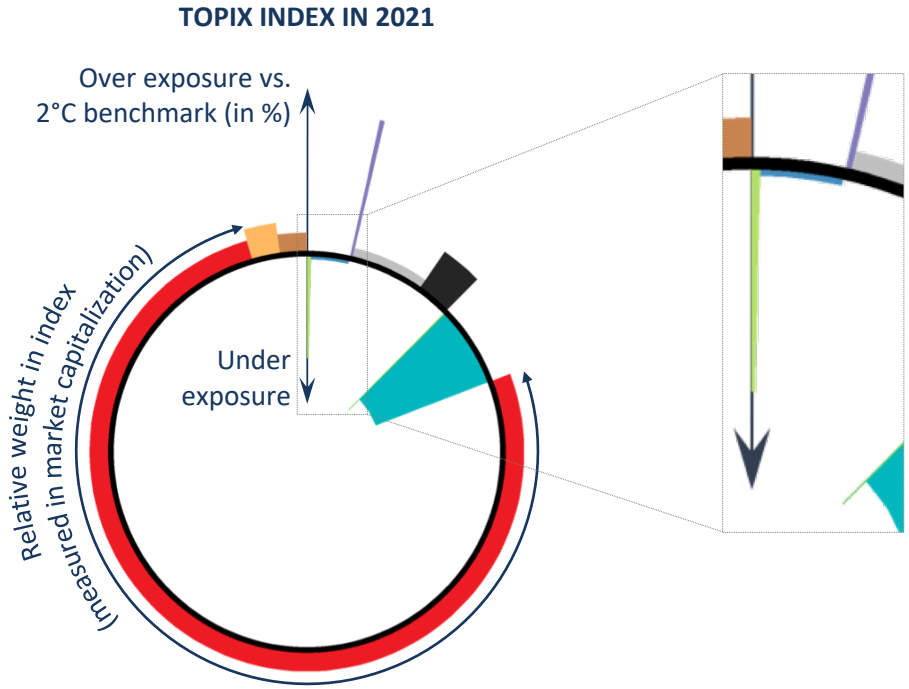
For a technology required to decrease …

- If a company owns 5% of **coal power** capacity in Japan today

→ 5% of total coal power required retirements to meet 2°C are allocated to the company

Results

Figure 6. Estimated 2°C alignment of the TOPIX in 2021.



NB: Auto

- 9% of TOPIX market capitalisation
- 83% of our sample

2°C MISALIGNMENT IN %

Electric Power		Light Automotive		Fossil Fuels	
Renewables	-74.1%	Electric	-97.8%	Gas production	23.2%
Hydro	-4%	Hybrid	-87.4%	Oil production	14.9%
Nuclear	623.9%	ICE	15.2%		
Gas	8%				
Coal	32.3%				

Hugues Chenet, TOPIX alignment with 2°C, Feb.28, 2018

Results

➔ TOPIX index is not aligned with the 2°C climate goal for power, automobile and fossil fuels sectors

- Especially, TOPIX contains:

✗ – Too much coal and natural-gas electric power capacity than it should under a 2°C scenario

✗ – Not enough renewable power

✗ – Too much ICE vehicles relative to electric and hybrid vehicles

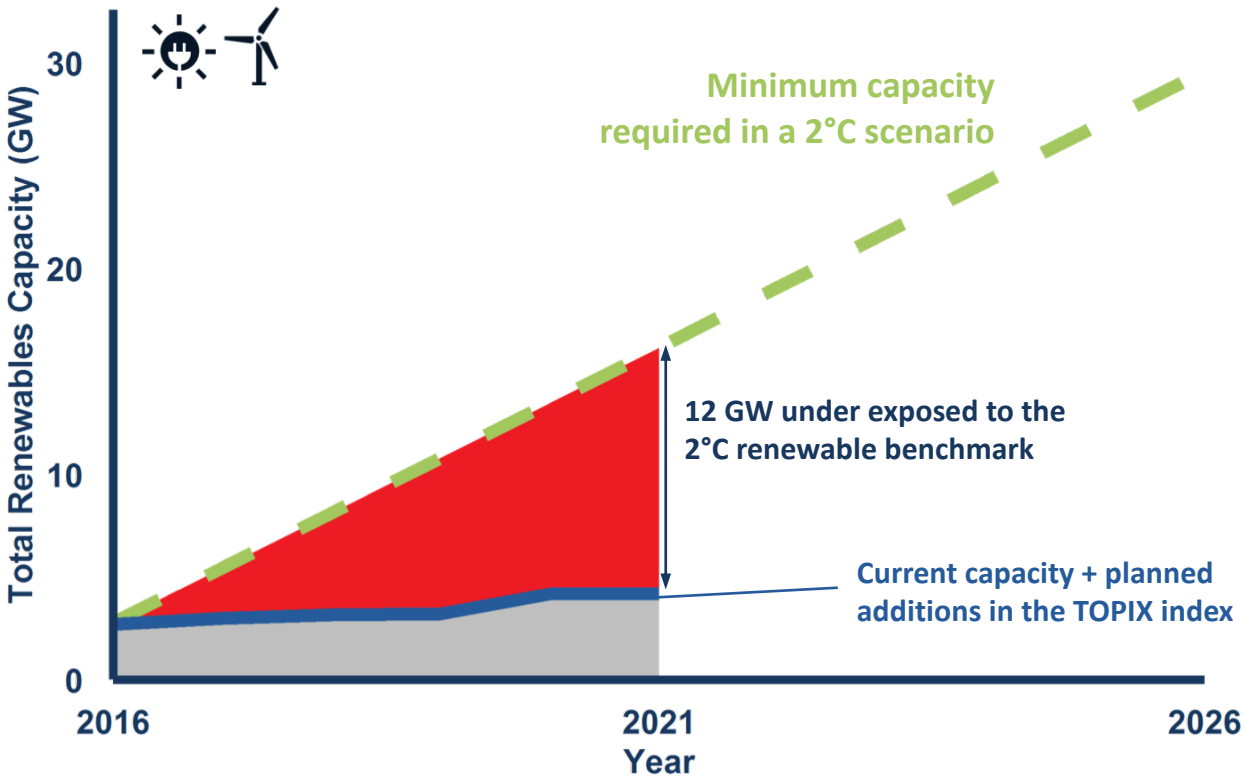
✗ – Too much oil and gas

✓ – But no coal production

- + being able to assess such alignment is a result in itself

Renewable power capacity

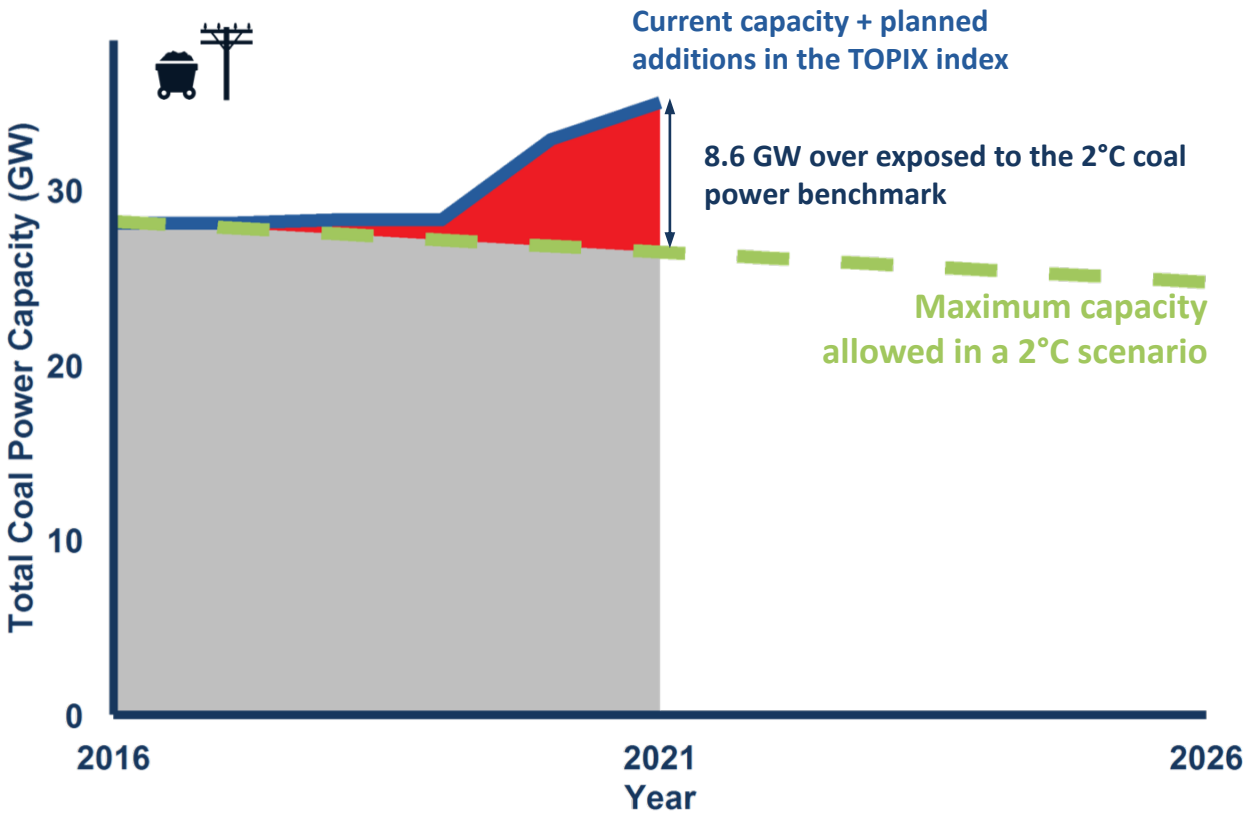
Figure 8. The evolution of the TOPIX renewable capacity versus the 2°C benchmark.



Hugues Chenet, TOPIX alignment with 2°C, Feb.28, 2018

Coal power capacity

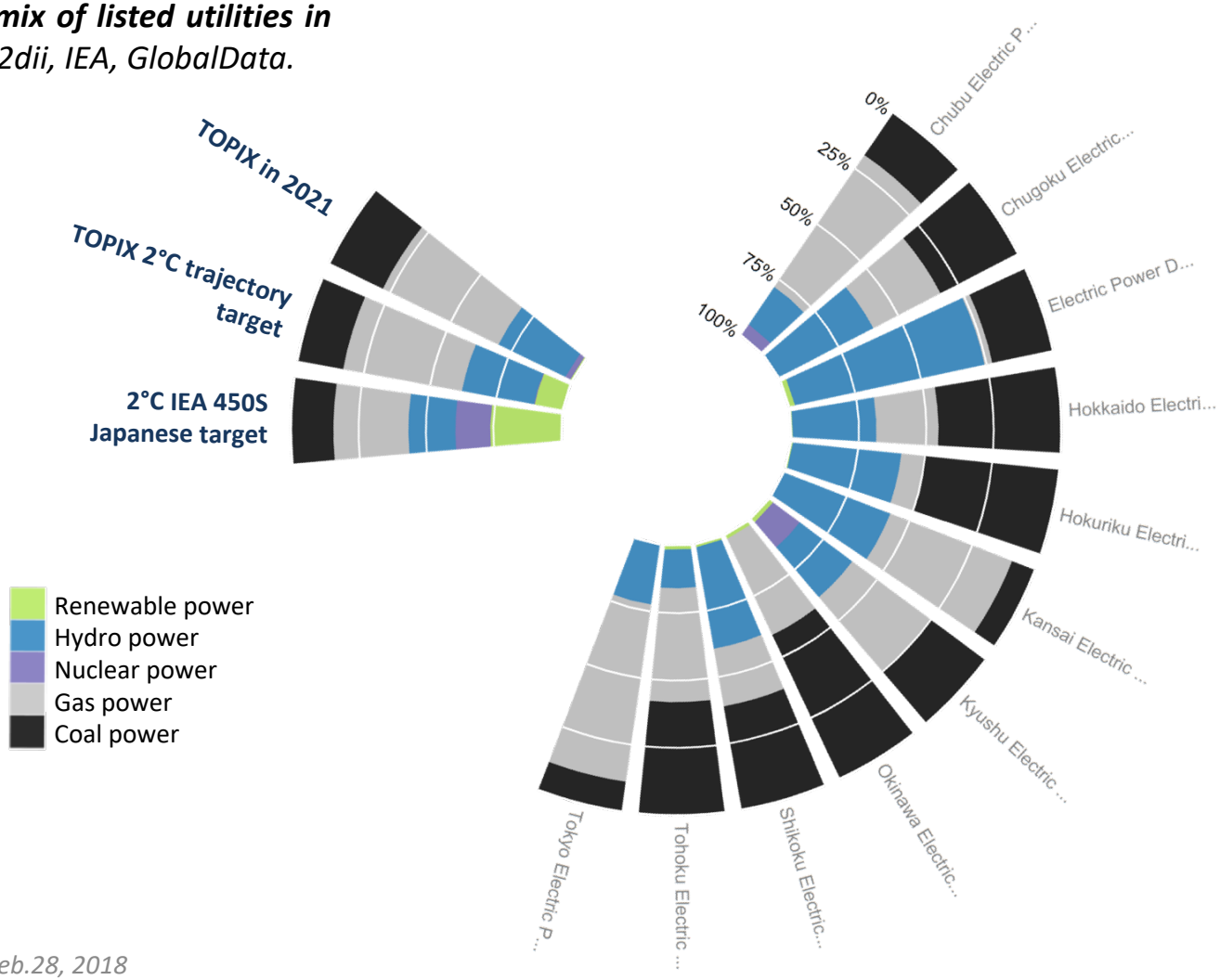
Figure 9. The evolution of the TOPIX ownership of coal capacity versus the 2°C benchmark.



Hugues Chenet, TOPIX alignment with 2°C, Feb.28, 2018

2021 fuel mix of the TOPIX

Figure 10. Estimated fuel mix of listed utilities in the TOPIX in 2021. *Source: 2dii, IEA, GlobalData.*



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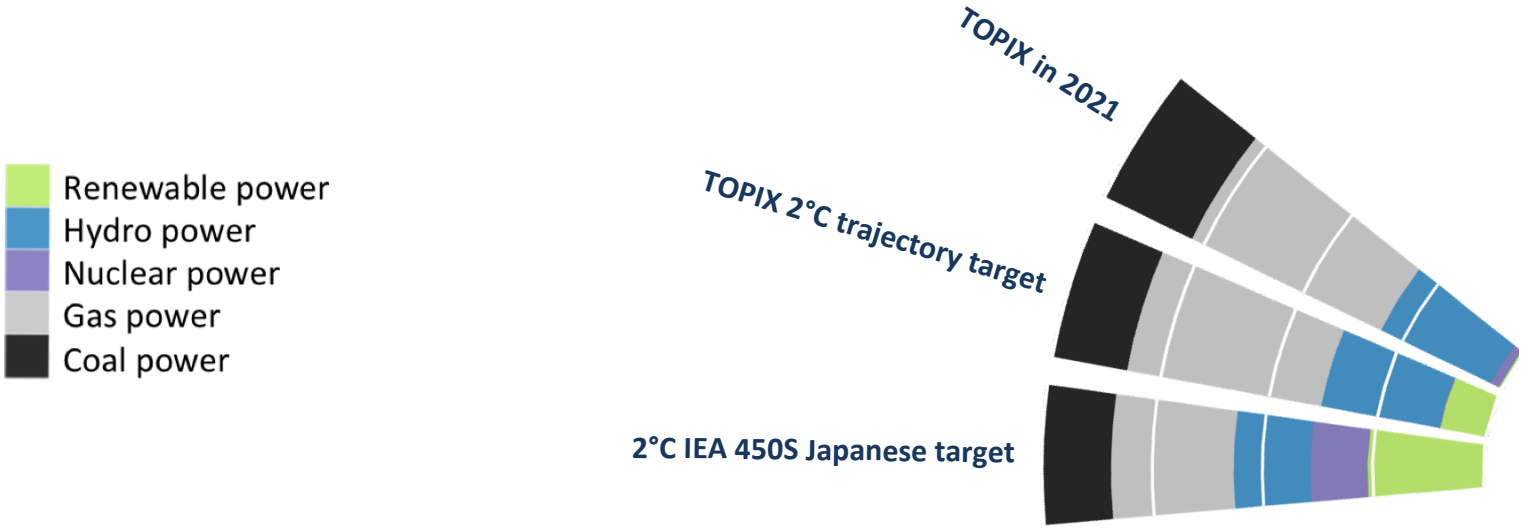
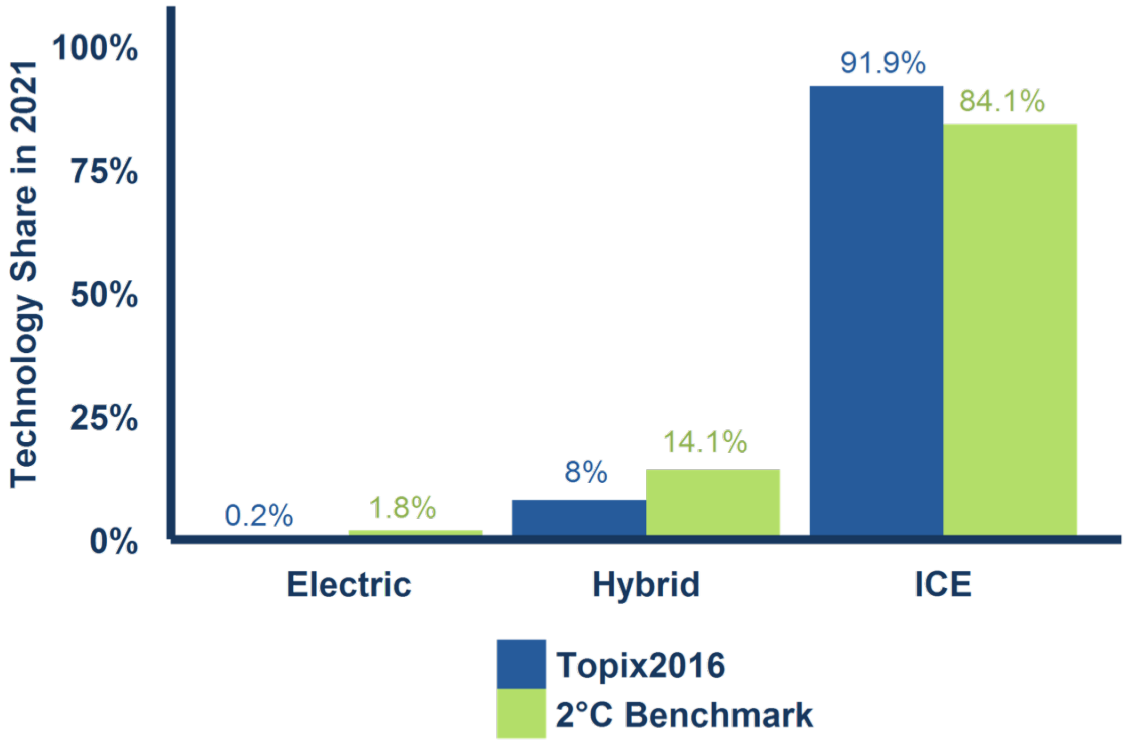


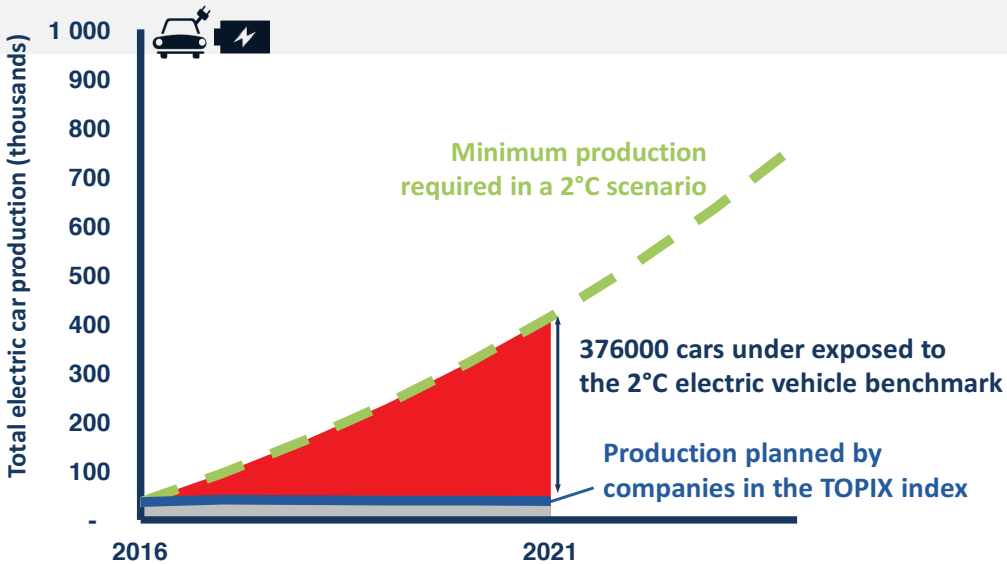
Automobile production

Figure 16. Estimated relative share of cars produced in 2021 for TOPIX and the 2°C benchmark.



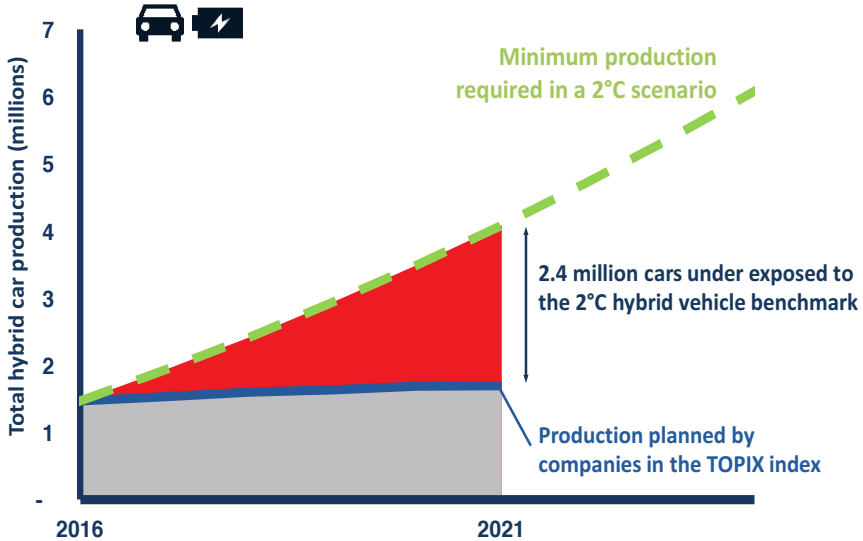
Automobile production

Figure 17. The evolution of TOPIX electric car production versus the 2°C benchmark.



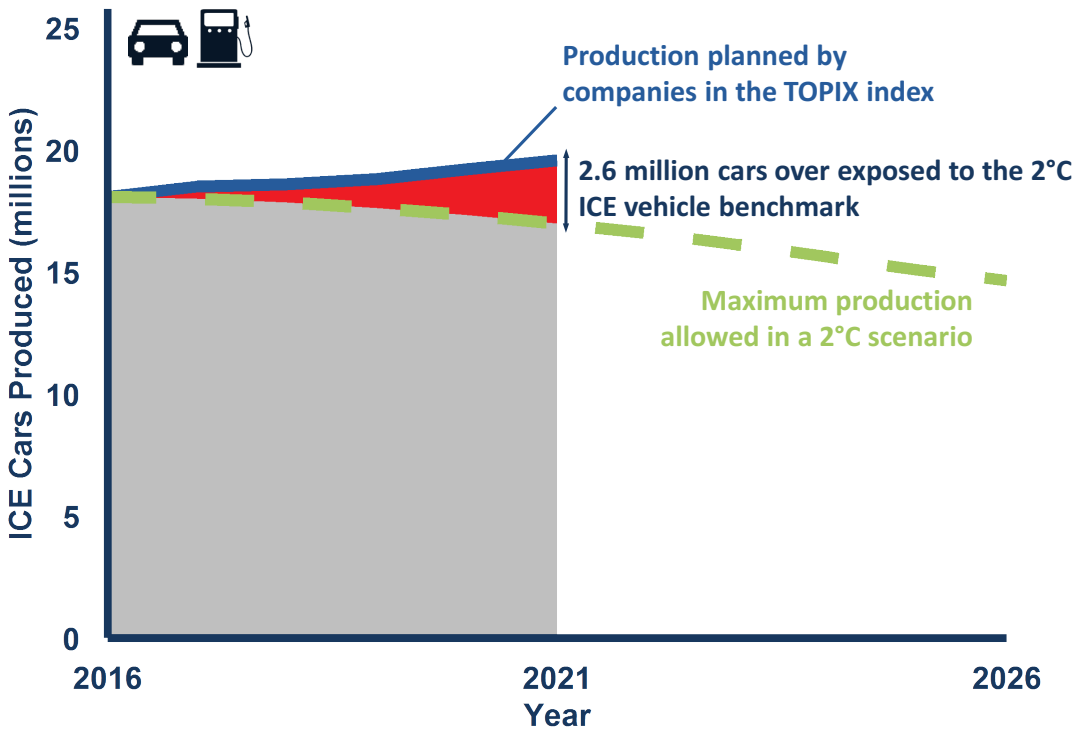
Source: 2dii, based on WardsAuto/ AutoForecast Solutions and IEA

Figure 18. The evolution of TOPIX hybrid car production versus the 2°C benchmark.



Automobile production

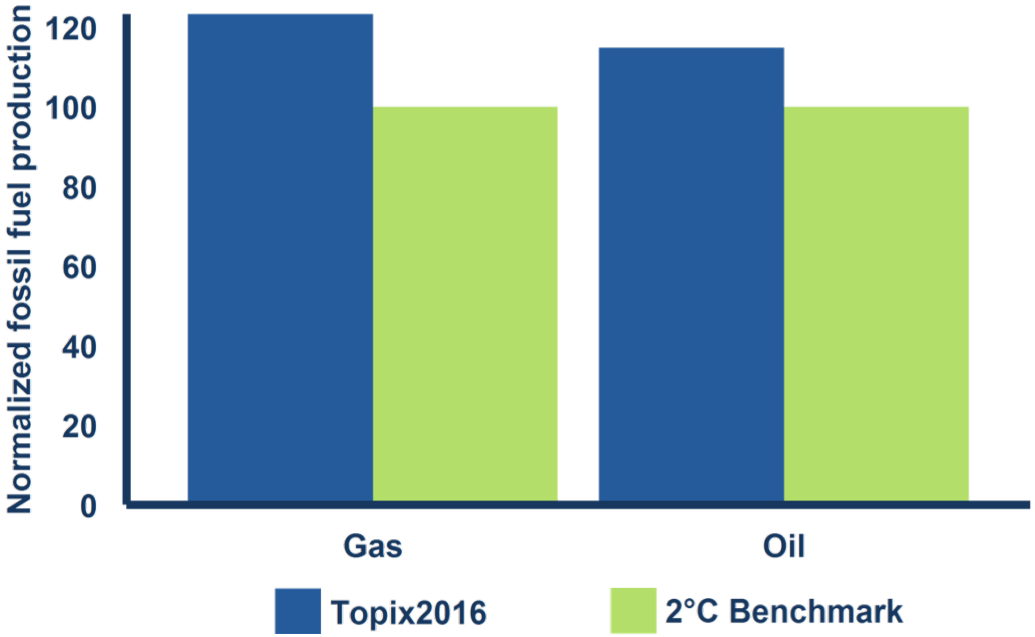
Figure 19. The evolution of TOPIX ICE car production versus the 2°C benchmark.



Source: 2dii, based on WardsAuto/ AutoForecast Solutions and IEA

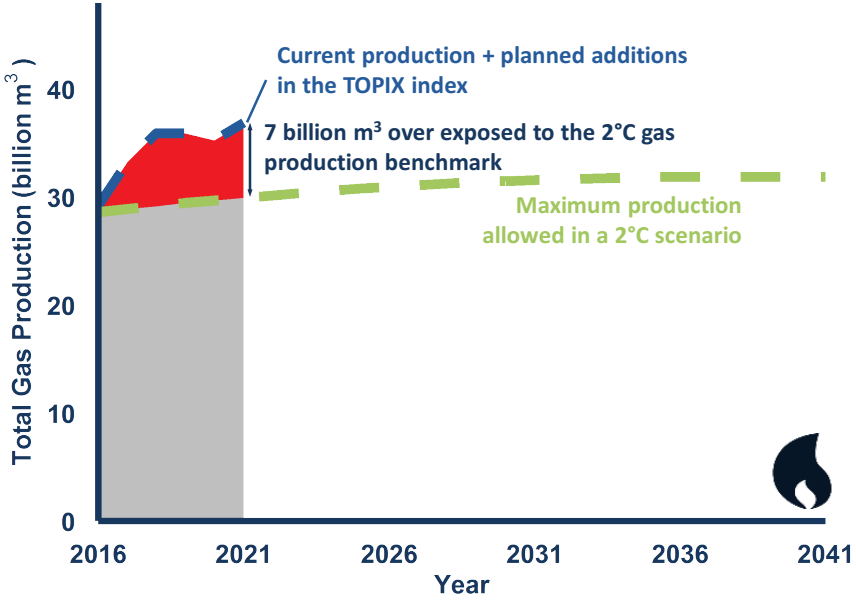
Oil and gas production

Figure 24. Estimated relative exposure to fossil fuel production in 2021 normalised to 100 (2°C benchmark = 100).
Source: 2°ii, based on Bloomberg and IEA.

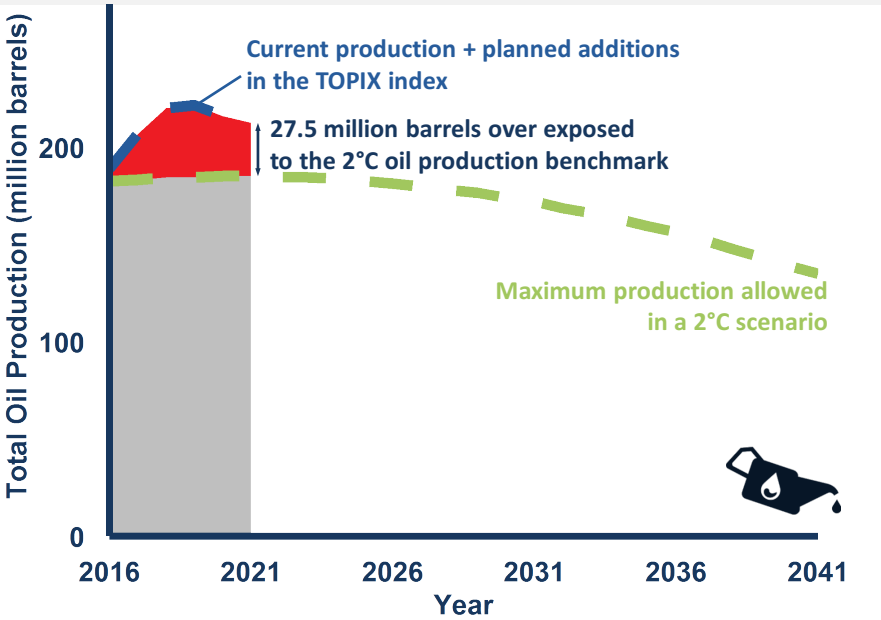


Oil and gas production

Figure 25. Estimated ownership of the TOPIX oil production versus 2°C benchmark. *[NB: The analysis at this stage does not address downstream companies (e.g. pipeline, etc.), which will be explored in further detail in the next stage of the model.]*



Source: 2ii, based on GlobalData and IEA



Source: 2ii, based on GlobalData and IEA

Figure 26. Estimated ownership of the TOPIX gas production versus 2°C benchmark. *[NB: The analysis at this stage does not address downstream companies (e.g. pipeline, etc.), which will be explored in further detail in the next stage of the model.]*

Conclusion for stakeholders

The results call for

- ➔ more informed investment strategies towards decarbonization
- ➔ better policy signals oriented at investors and industrial companies

This would allow the financial sector to be able to contribute more effectively to the fight against climate change

Thank you for your attention.
Merci !

Feel free to contact me:
hugues@2degrees-investing.org

Hugues CHENET
Co-Founder and Non-Executive Director