A Responsible Approach to the Energy Transition – the Uruguay Model

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Punta del Este, Uruguay

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AAPG | LATIN AMERICA & CARIBBEAN ENERGY SUMMIT

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- Global Energy Transition
- And in Uruguay
- ANCAP’s Projects
- Conclusion

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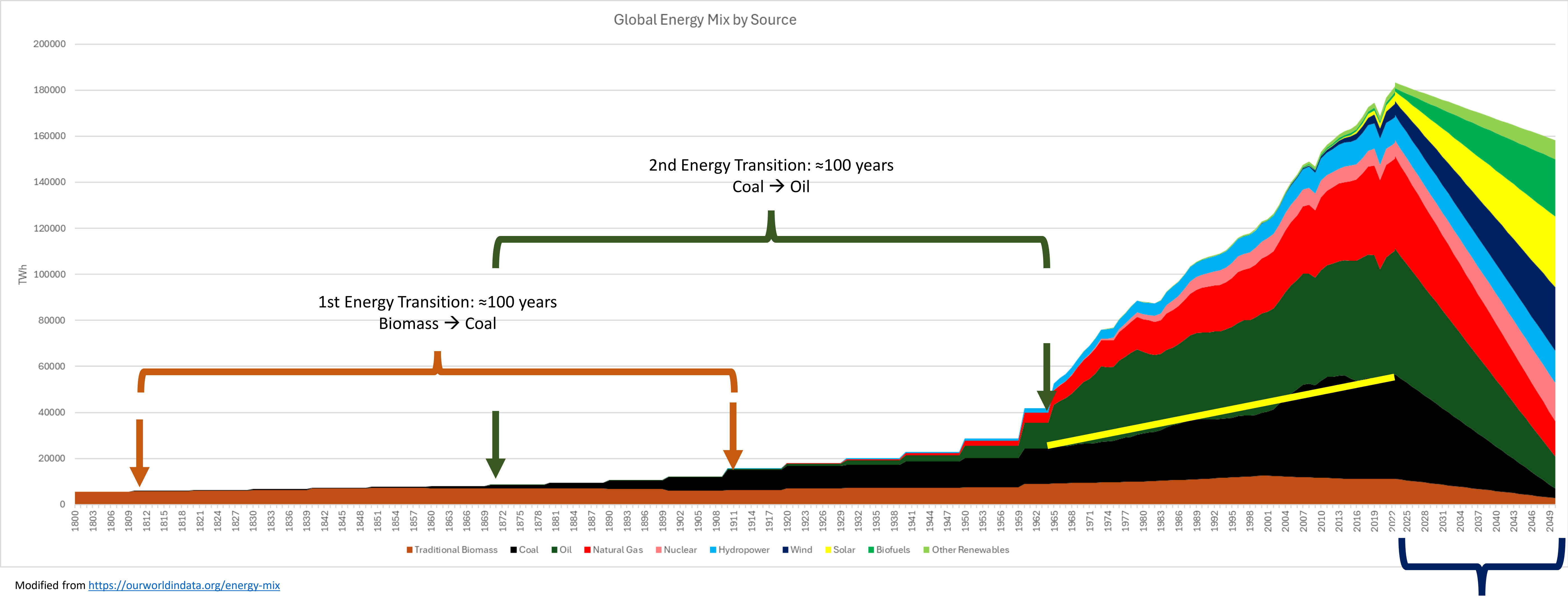
223 years of **Energy** use



Current Energy Transition: ≈30 years

Modified from https://ourworldindata.org/energy-mix

Energy security on top of the agenda

Despite climate commitments, the EU is going back to coal

Faced with gas shortages, several EU member states, including France, have announced the extension or reopening of coal-fired power plants that were shut down in response to climate change issues.

Le Monde

Published on September 2, 2022 at 05h00, updated at 07h19 on September 2, 2022 · 4 min. · Lire en français

Subscribers only

https://www.lemonde.fr/en/economy/article/2022/09/02/despite-climate-commitments-the-eu-is-going-back-to-coal_5995594_19.html

https://energyminute.ca/infographics/the-largest-source-of-power-in-europe/

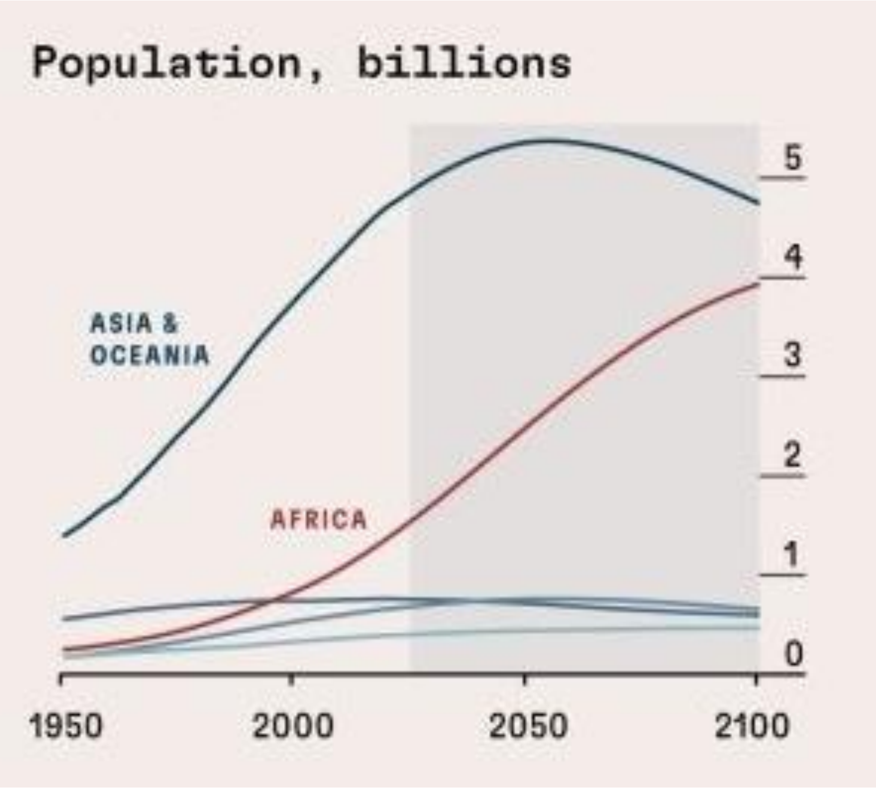
New Zealand reverses controversial exploration ban, proposes legislative changes to boost upstream investment

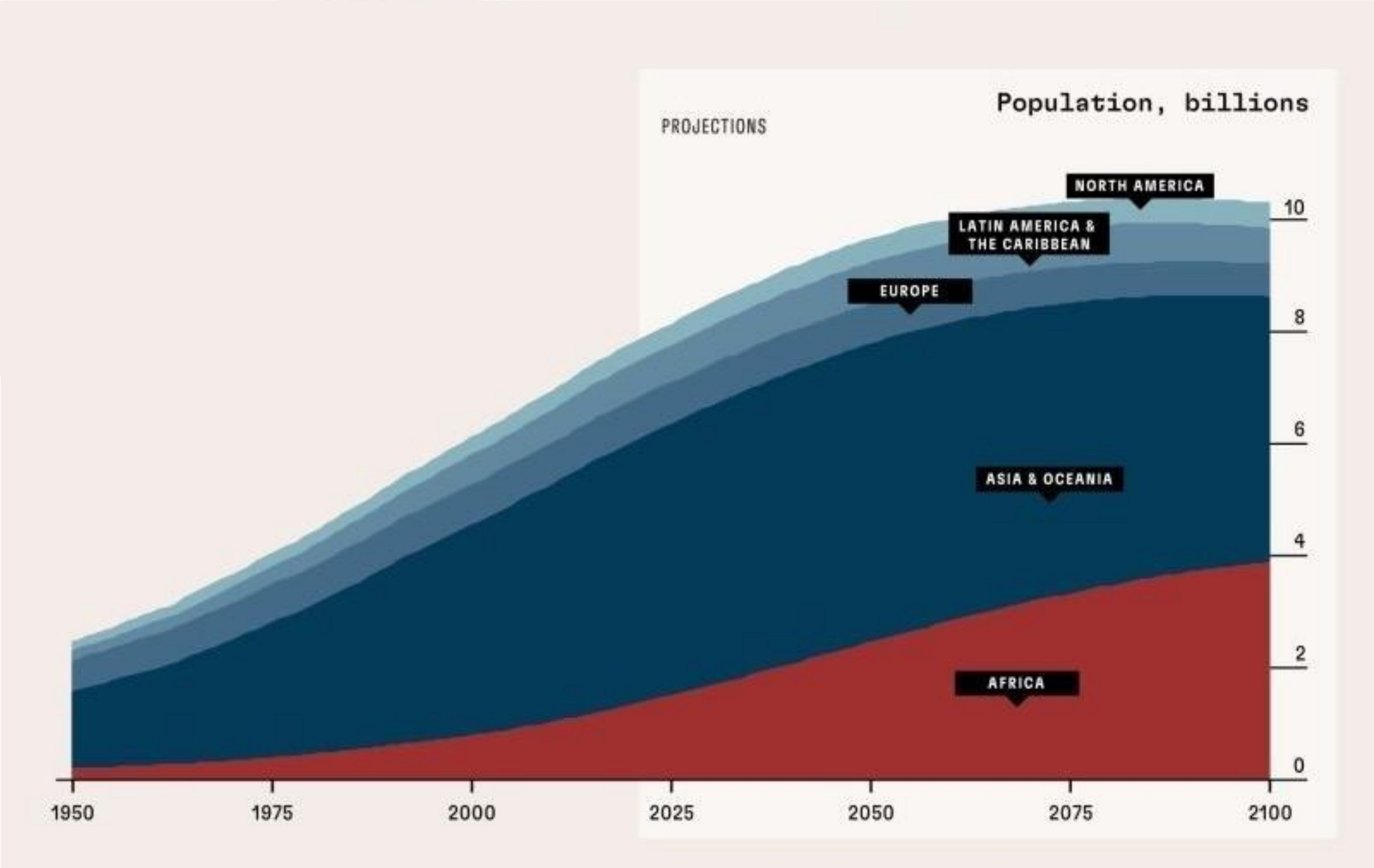
Resources Minister Shane Jones moves to deal with energy security challenges

The Tui field in the Taranaki basin offshore New Zealand. (Photo: AWE)

https://www.upstreamonline.com/politics/new-zealand-reverses-controversial-exploration-ban-proposes-legislative-changes-to-boost-upstream-investment/2-1-1658143

Population growing





https://www.linkedin.com/posts/alessandro-blasi-6579a66_africa-jobs-energy-activity-7143973200731729920-Jr90?utm_source=share&utm_medium=member_desktop

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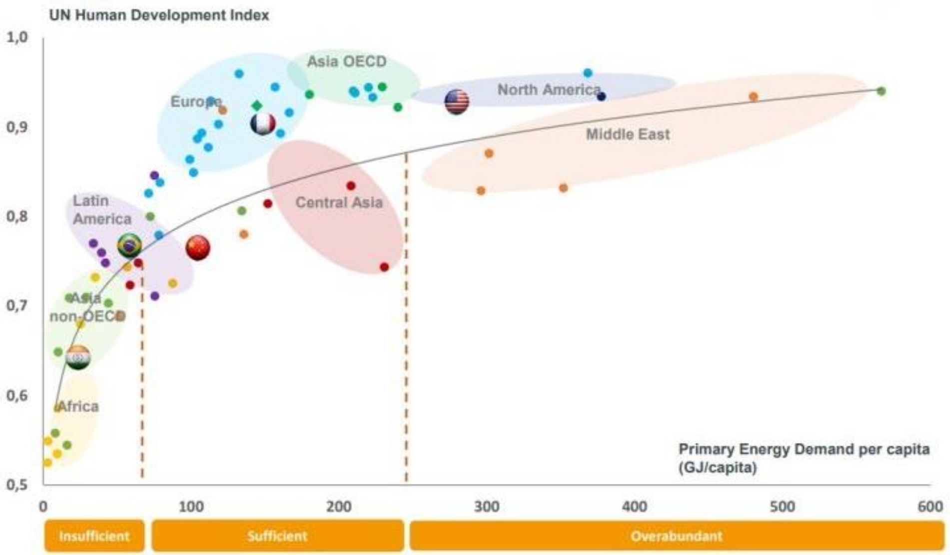
Energy consumption and development



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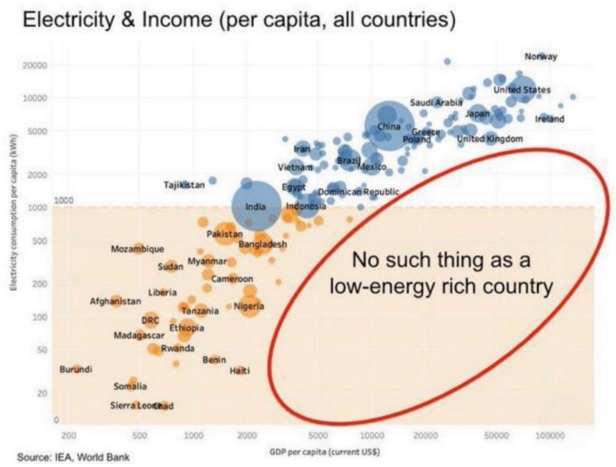
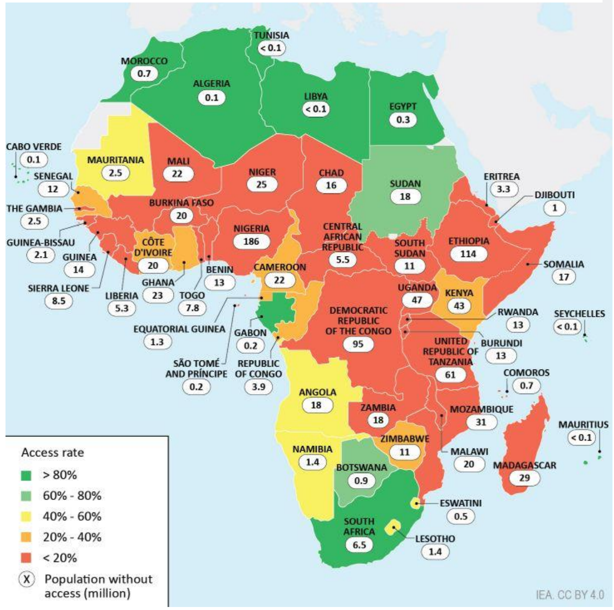


https://www.linkedin.com/posts/alessandro-blasi-6579a66_energy-data-sustainability-activity-7245801677377671169-gwSZ?utm_source=share&utm_medium=member_desktop

Population without access to clean cooking in Africa, 2022



https://www.linkedin.com/posts/alessandro-blasi-6579a66_africa-cop28-energy-activity-7135938638034432000-YonB?utm_source=share&utm_medium=member_desktop

Africa will remain poor unless it uses more energy

The Economist

Greenhouse-gas emissions south of the Sahara are tiny

https://www.economist.com/middle-east-and-africa/2022/11/03/africa-will-remain-poor-unless-it-uses-more-energy

Difficult, Complex, Challenging

Bill Gates: Shift to low-carbon energy 'far more difficult than anything I worked on at Microsoft'

Technology backer and philanthropist speaks at oil and gas conference during Texas energy transition tour

https://www.rechargenews.com/energy-transition/bill-gates-shift-to-low-carbon-energy-far-more-difficult-than-anything-i-worked-on-at-microsoft/2-1-1616666?zephr_sso_ott=noH7wG

Katja Buchholz/Getty Images/Project Syndicate

The Energy Transition Confronts Reality

Daniel Yergin
Vice Chairman, S&P Global and author of The New Map: Energy, Climate, and the Clash of Nations.

13 de febrero de 2023

Given the scale and complexity of the transition away from hydrocarbons, some worry that economic analysis has been given short shrift in the policy planning process. A clear-eyed assessment of the transition's prospects requires a deeper understanding of at least four major challenges.

https://www.linkedin.com/pulse/energy-transition-confronts-reality-daniel-yergin/

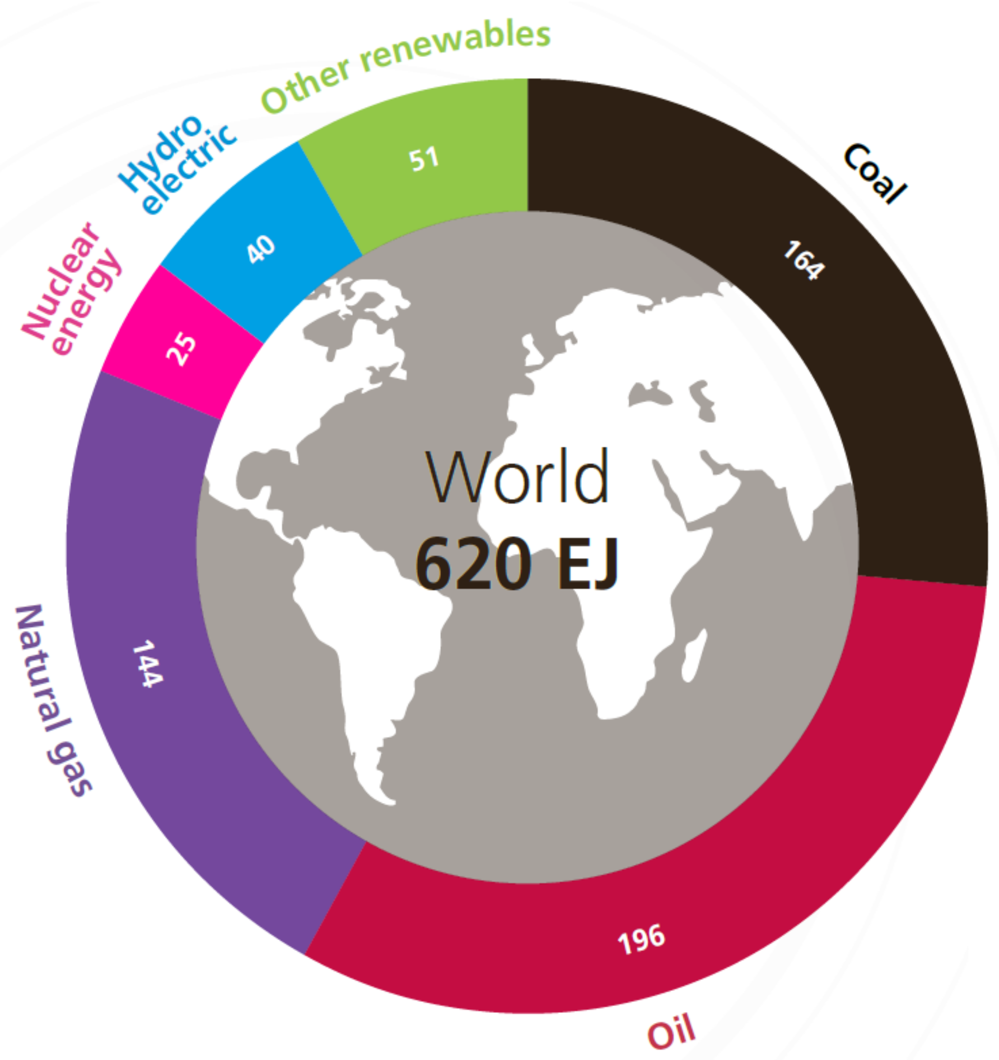
ExxonMobil chief: People underestimate challenge of moving away from fossil fuels

ExxonMobil, Saudi Aramco and CNPC believe energy demand will continue to grow

Assessment: ExxonMobil chief executive Darren Woods takes part in a panel discussion at the 24th World Petroleum Congress in Calgary, Canada (Photo: AP/SCANPIX)

https://www.upstreamonline.com/energy-transition/exxonmobil-chief-people-underestimate-challenge-of-moving-away-from-fossil-fuels/2-1-1520196

Today's energy system and the transition

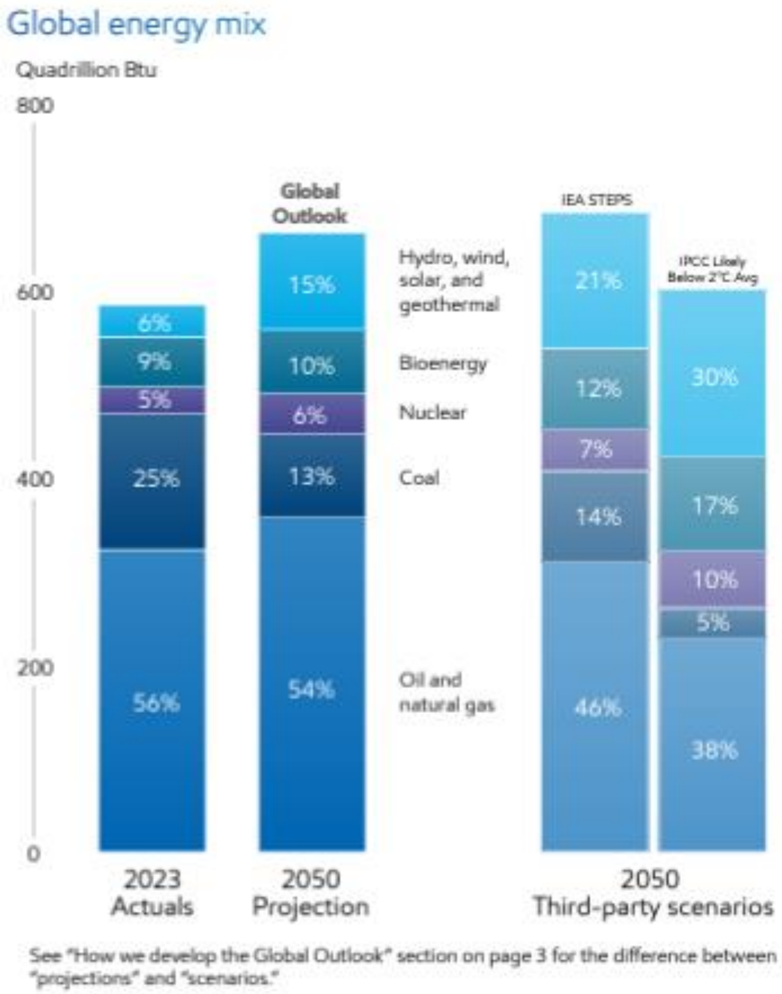


81,3% Fossil Fuels

https://www.energyinst.org/statistical-review

And, not or

https://www.bp.com/en/global/corporate/what-we-do/our-transformation.html

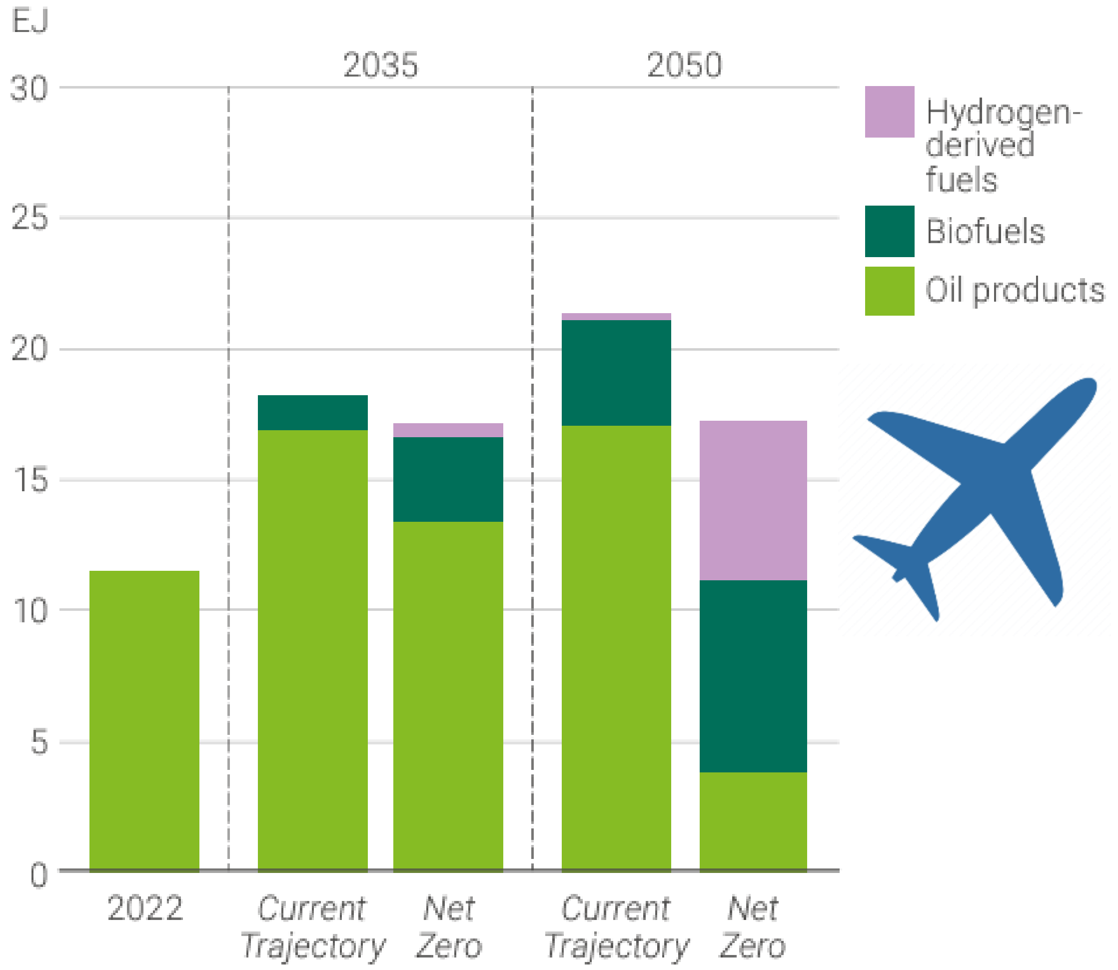


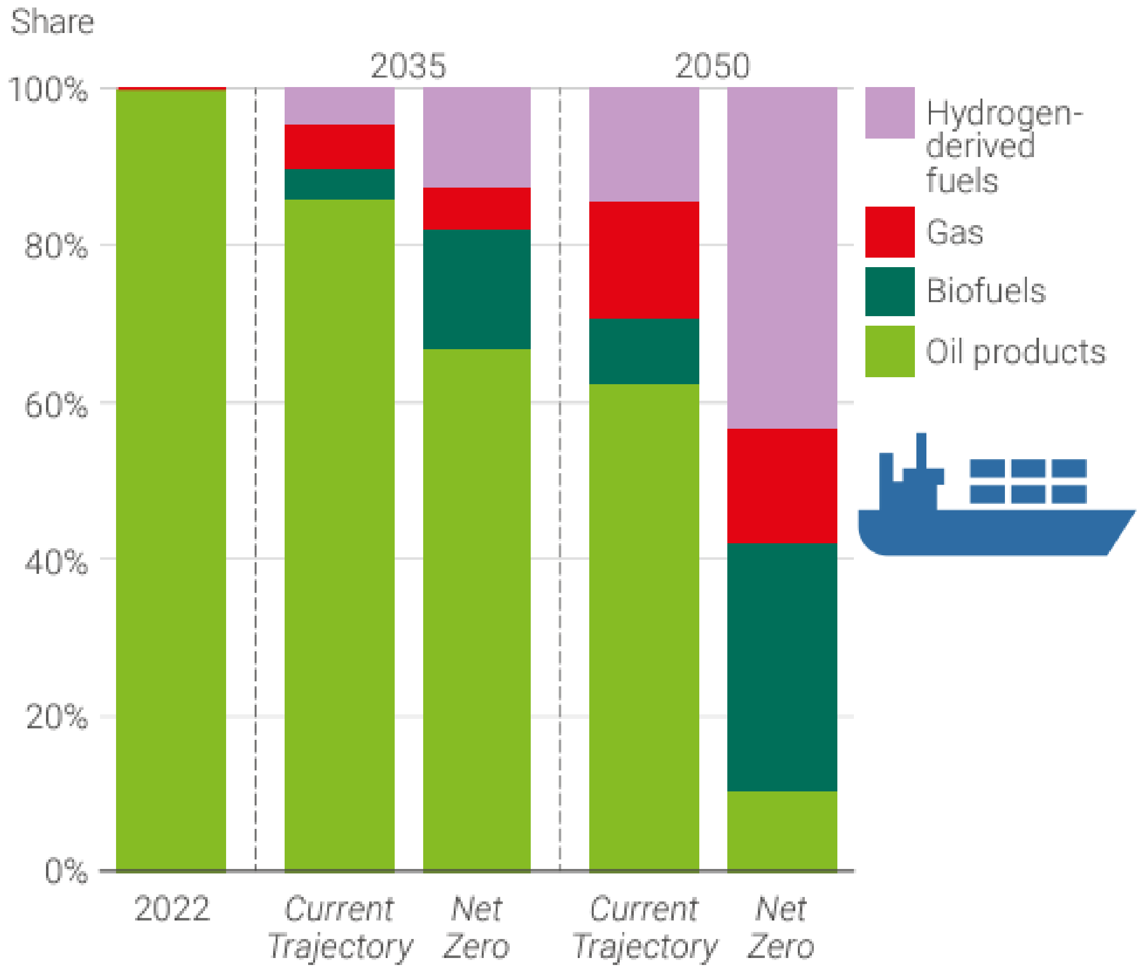
- All energy types will remain in the mix

https://corporate.exxonmobil.com/-/media/global/files/global-outlook/2024/global-outlook-executive-summary.pdf

Sustainable molecules: biofuels and e-fuels

Aviation and marine transportation are increasingly decarbonized through a combination of hydrogen-derived fuels and biofuels

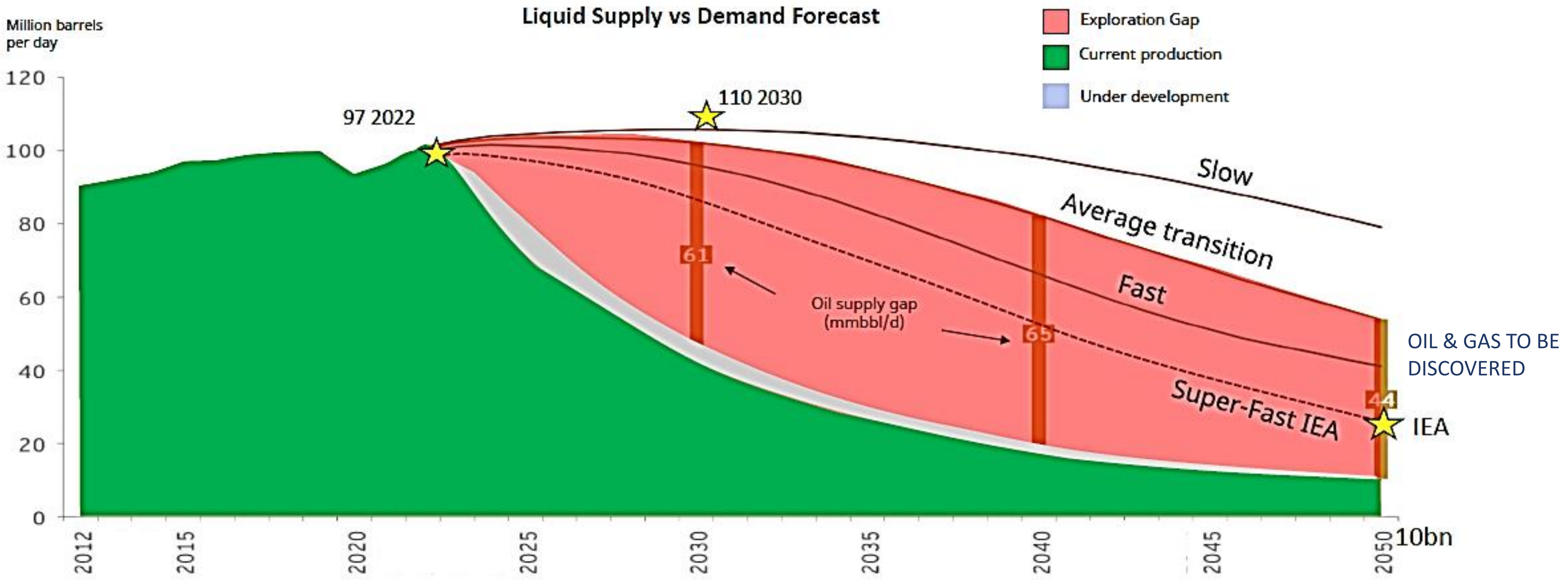




https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2024.pdf

What is going on with E&P globally?

World needs more investments in oil production no matter the speed of energy transition – Rystad Energy



Source: Neil Hodgson; Searcher; World Energies Summit 2023; after Rystad Energy

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Realistic, Ordered, Balanced

The world must be realistic about energy transition

The world must establish a new energy supply system before tearing down the old one

The consensus reached at CERAWeek is that **energy security is vital for a successful energy transition**. Given the intermittent aspects of renewable energies such as wind and solar, and how deeply the use of fossil fuels in some form are ingrained in everyday lives, **the oil and gas sector will not disappear overnight**.

https://www.upstreamonline.com/opinion/the-world-must-be-realistic-about-energy-transition/2-1-1418705

Welcome to the 2023 edition of bp's *Energy Outlook*.

The recent energy shortages and price spikes highlight the importance of the **transition away from hydrocarbons being orderly**, such that the demand for hydrocarbons falls in line with available supplies. Natural declines in existing production sources mean there **needs to be continuing upstream investment in oil and natural gas over the next 30 years**.

https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2023.pdf


Zoë Yujnovich; Integrated Gas and Upstream Director; Shell

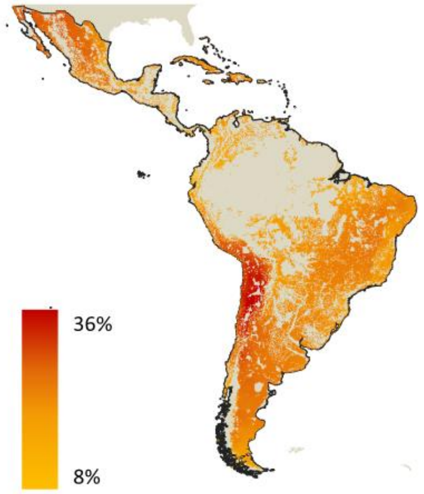
Big Oil Revives Offshore Exploration

Continued investments in oil and gas will be needed to make sure that the **energy transition happens in a balanced way** with a secure supply of affordable and increasingly lower-carbon energy. We will contribute to this **balanced transition** by focusing our investments on the most profitable and carbon-competitive projects

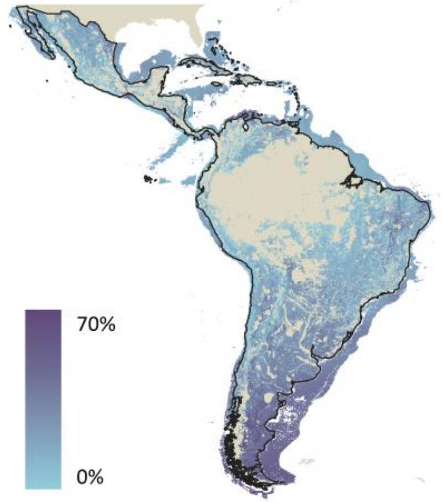
https://oilprice.com/Energy/Energy-General/Big-Oil-Revives-Offshore-Exploration.html

Latin America is key for the solution

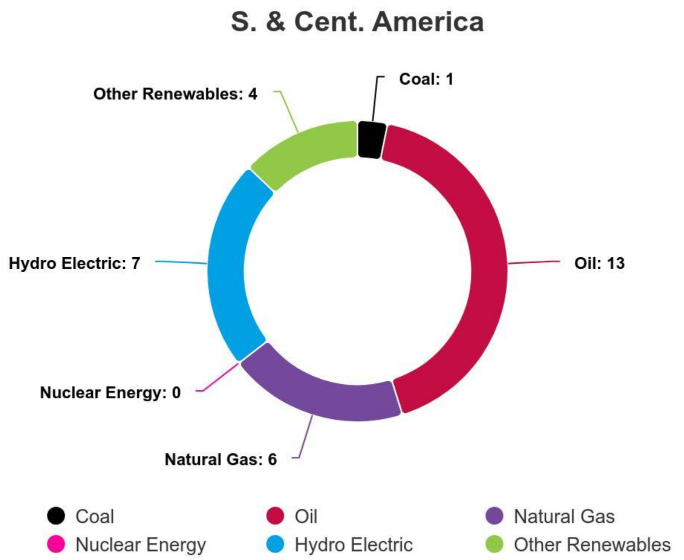
Average solar PV capacity factor



Average wind capacity factor

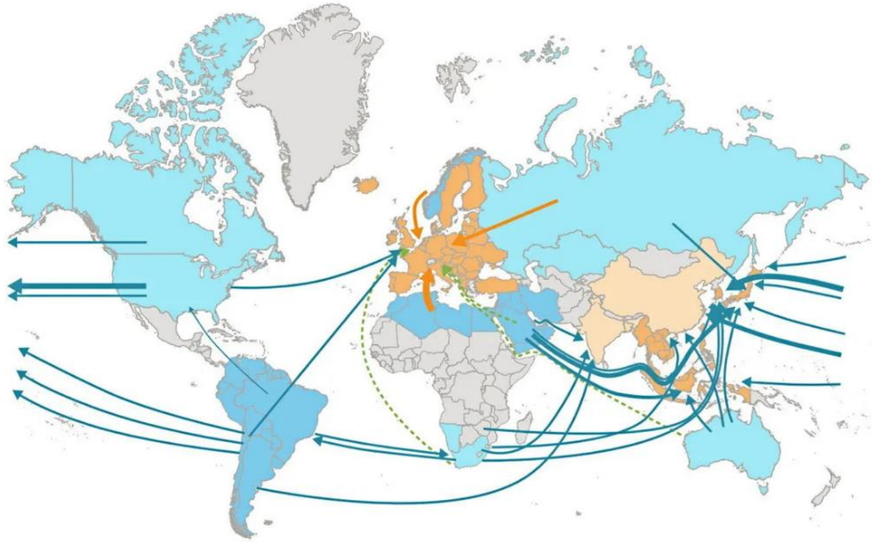


https://iea.blob.core.windows.net/assets/1055131a-8dc4-488b-9e9e-7eb4f72bf7ad/LatinAmericaEnergyOutlook.pdf



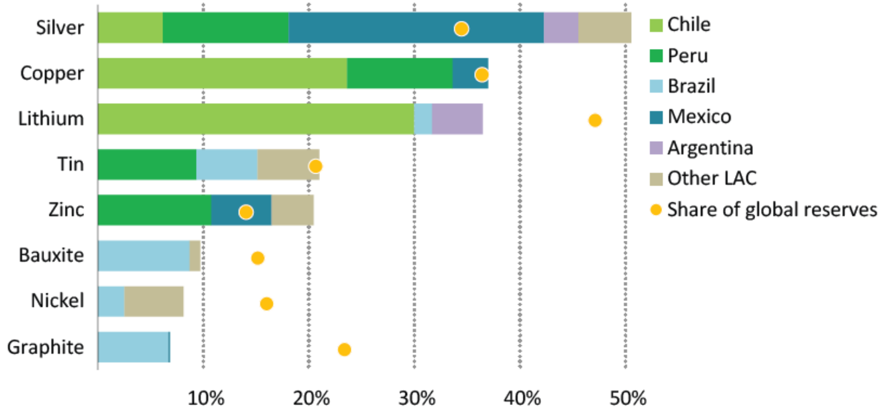
https://www.energyinst.org/statistical-review

Green Hydrogen Exporters



https://www.hydrogeninsight.com/analysis/more-than-60-of-all-clean-hydrogen-will-be-transported-over-long-distances-by-2050-hydrogen-council/2-1-1329563?zephr_sso_ott=X1sXN6

LAC is highly significant for the production of lithium and other critical minerals required for clean energy transitions



https://iea.blob.core.windows.net/assets/1055131a-8dc4-488b-9e9e-7eb4f72bf7ad/LatinAmericaEnergyOutlook.pdf

- 64,5 % fossil fuels in primary mix << 81,3% world
- 64% renewables in electricity >> global 39%
- Hydropower 43% (#1 Source in LAC)
- Oil producers: Brazil, Mexico, Colombia, Venezuela, Guyana
- Reserves and production of critical minerals
- Twice the share of biofuels in transport that the world has
- Net exporters of green H2 and derivatives

https://ember-energy.org/countries-and-regions/latin-america-and-caribbean/#:~:text=64%25,the%20region's%20electricity%20in%202023.
https://www.statista.com/statistics/664678/electricity-generation-mix-latin-america-by-technology/#:~:text=Services-,About%20Statista,at%2036%20percent%20in%202023
https://www.linkedin.com/posts/alessandro-blasi-6579a66_china-india-africa-activity-7128012147388747776-ctD1?utm_source=share&utm_medium=member_desktop

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Responsible Energy Transition

Stipanicic resaltó el rol de Ancap para una transición energética "realista"

El presidente de la empresa estatal pidió planes que contemplen "un proceso largo de tiempo" y tengan en cuenta la demanda.

- Alejandro Stipanicic disertará sobre la transición energética en Uruguay
- ¿Cómo es el plan de Ancap para producir hidrógeno verde a partir de energía eólica offshore?

Alejandro Stipanicic disertó sobre el avance de la transición energética en Uruguay y en el mundo. | Foto: gentileza Somos Uruguay

https://www.ambito.com/uruguay/stipanicic-resalto-el-rol-ancap-una-transicion-energetica-realista-n5809488

- Fossil fuels AND renewable energies
- All energy types will remain in the mix
- Won't happen overnight
- NOT "One size fits all"
- Reduction of emissions
- Addition of energy
- More Energy efficiency
- Technology agnostic for a lower emissions future:
    - More renewables (solar and wind)
    - Hydrocarbons with CC
    - Green H2 and derivatives
    - More biofuels

in hard to abate sectors

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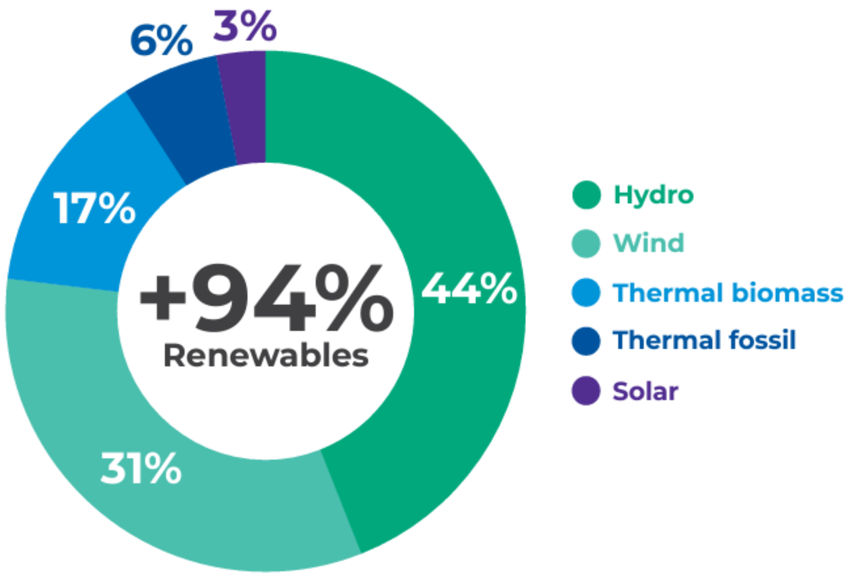
Uruguay: First energy transition successfully completed

Electricity generation matrix Avg 2016 – 2022

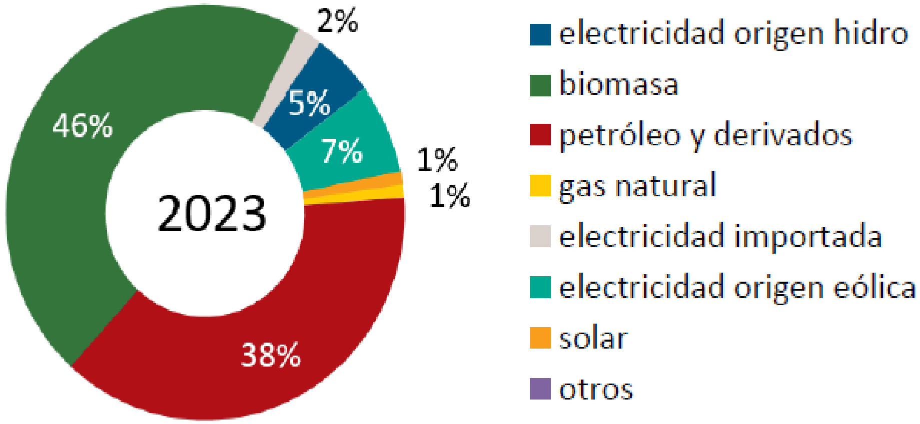


94% Renewables >> 64% LAC >> 39% Global

https://www.gub.uy/ministerio-industria-energia-mineria/sites/ministerio-industria-energia-mineria/files/documentos/noticias/H2_final-ingl%C3%A9s2020_0.pdf

https://www.theguardian.com/global-development/2023/dec/27/uruguays-green-power-revolution-rapid-shift-to-wind-shows-the-world-how-its-done

Primary matrix 2023



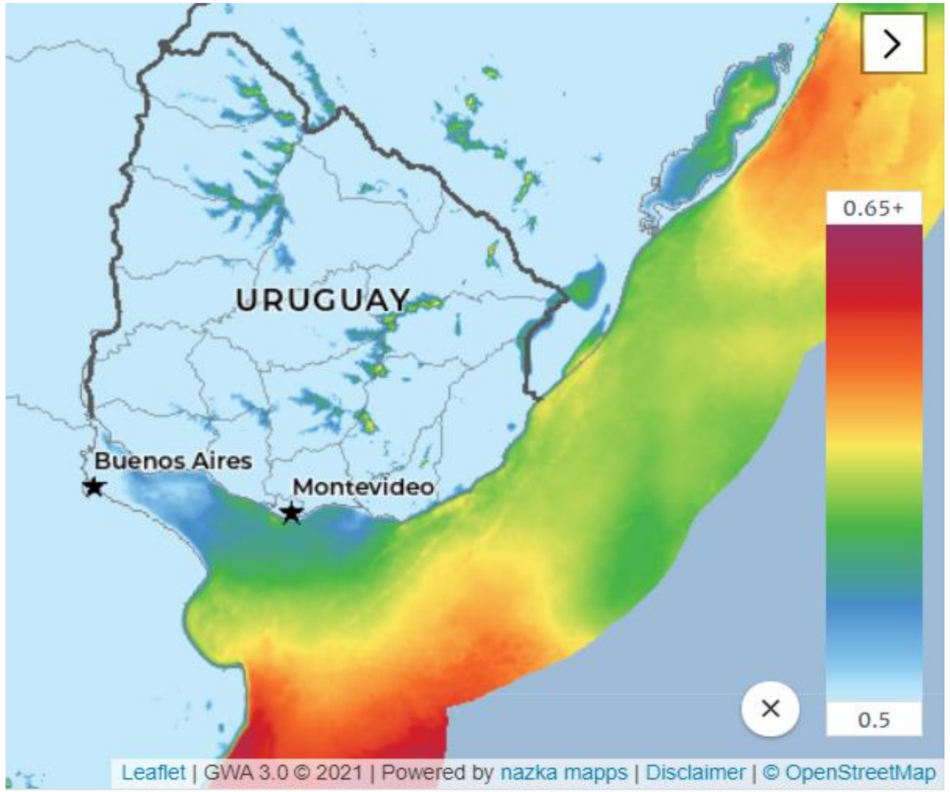
39% Fossil Fuels << 65% LAC << 81% Global

https://ben.miem.gub.uy/descargas/1balance/Presentaci%C3%B3n%20BEN2023.pdf

ANCAP

Excellent conditions for the second energy transition

- Renewable potential
  - On land: 30 GW of Tier I wind and 60 GW of Tier I solar, with high complementarity
  - Offshore: 275 GW of wind
- Biomass residues of forestry and agricultural origin as a source of biogenic CO2
- Water resources
- Feedstocks for biorefinery



[Data/information/map obtained from the] "Global Wind Atlas 3.0, a free, web-based application developed, owned and operated by the Technical University of Denmark (DTU). The Global Wind Atlas 3.0 is released in partnership with the World Bank Group, utilizing data provided by Vortex, using funding provided by the Energy Sector Management Assistance Program (ESMAP). For additional information: https://globalwindatlas.info"

https://globalwindatlas.info/es

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ANCAP: shifting towards an Integrated Sustainable Energy Company

Reduction of emissions of current operations (upstream & downstream)

Tender of offshore blocks for green H_2 production

Synthetic fuels (e-fuels / e-methanol) + biogenic CO_2 capture

2nd generation biofuels: HVO / SAF (HEFA route) Project at La Teja Refinery

CO_2 storage in saline aquifers

Assesment of potential for natural / geologic H_2

Ethanol to SAF (Jet) pilot plant

#ResponsibleTransition

ANCAP: enabling the 2nd phase of the Energy Transition

ANCAP Group: The largest industrial conglomerate in Uruguay
We have key assets to make energy transition projects viable

Production and sale of energetics

Fuels
50.000 barrels/day

Industrial Plants
18

Biofuels
140.000 m3/year

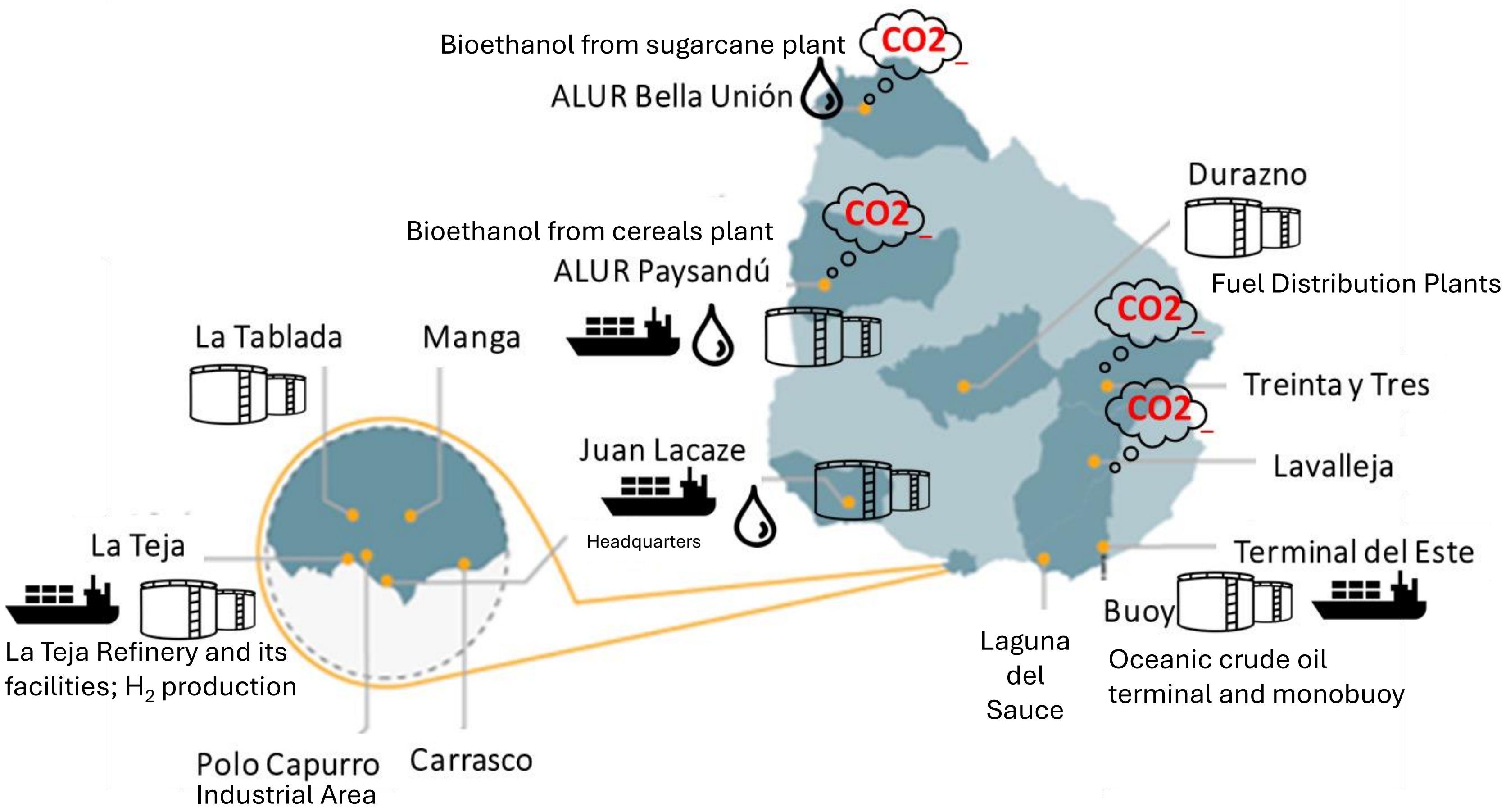
Employees
3300

Lubricants
16.000 m3/year

2023 Results
3296 MMUS$
Gross Income

Gas Station
Network 285

Natural Gas
250.000 m3/day



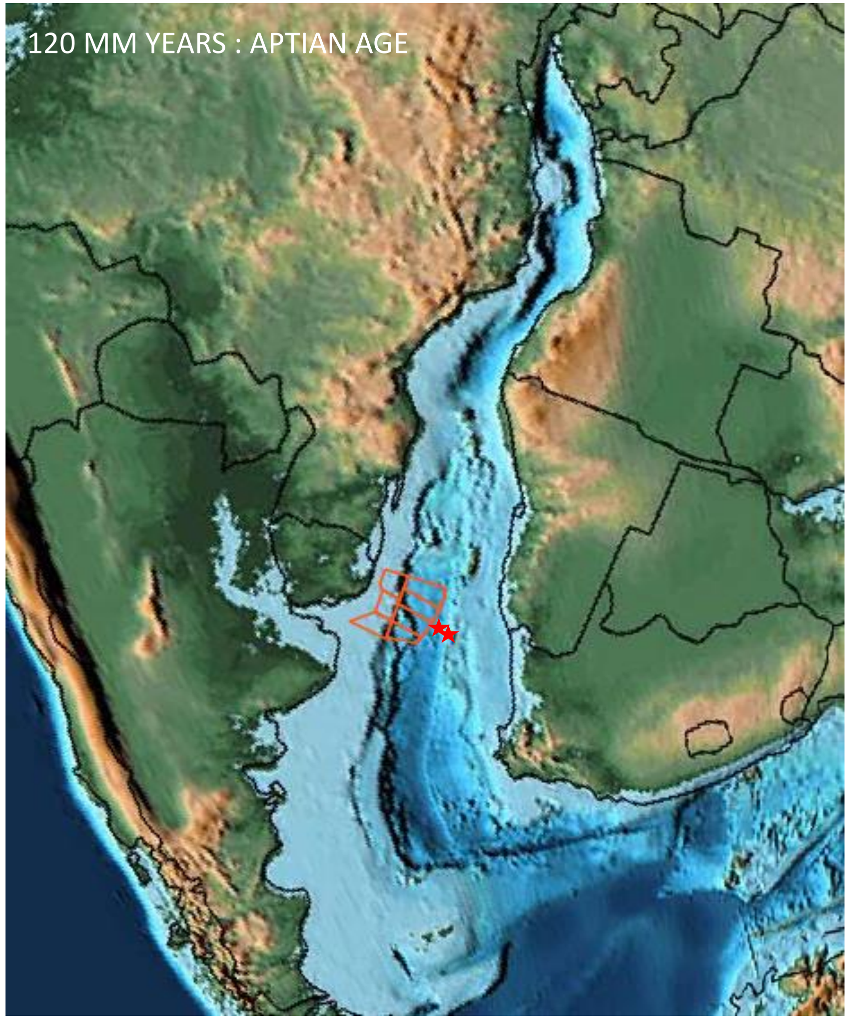
Decarbonizing La Teja refinery is equivalent to introducing 45,000 EV

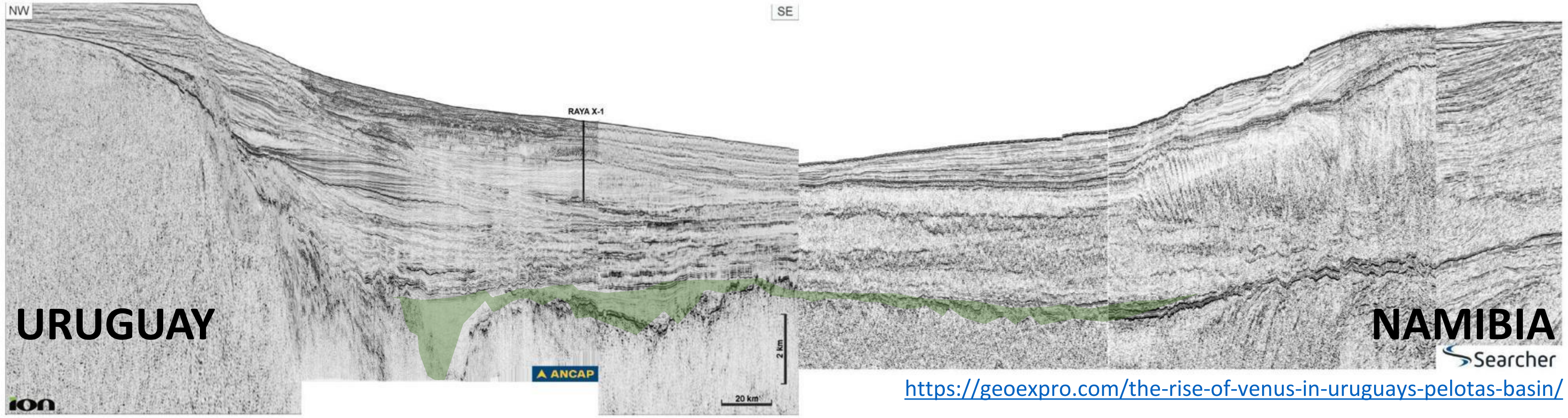
In this last maintenance shut down of the La Teja refinery, ANCAP substituted completely the usage of fuel oil by natural gas for its furnaces and boilers, and this with this obtained a “reduction of carbon dioxide emissions (CO2) which equals to having introduced 45.000 electric vehicles in Uruguay”, said to El País the president of ANCAP, Alejandro Stipanicic.

https://www.elpais.com.uy/sostenible/descarbonizacion-en-refineria-de-la-teja-equivale-a-introducir-45-000-autos-electricos-en-el-pais

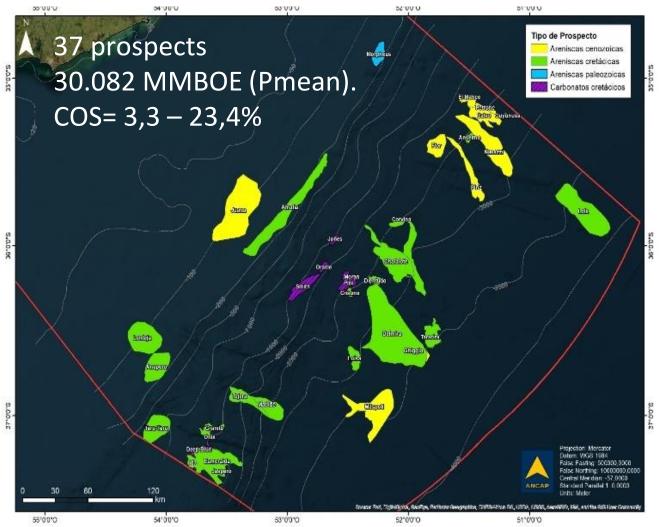
Renewed interest for exploration offshore Uruguay

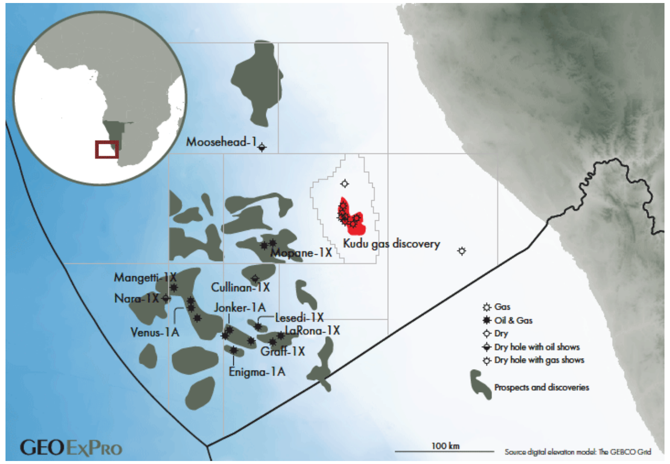
Remarkable analogies with Namibia





https://geoexpro.com/the-rise-of-venus-in-uruguays-pelotas-basin/

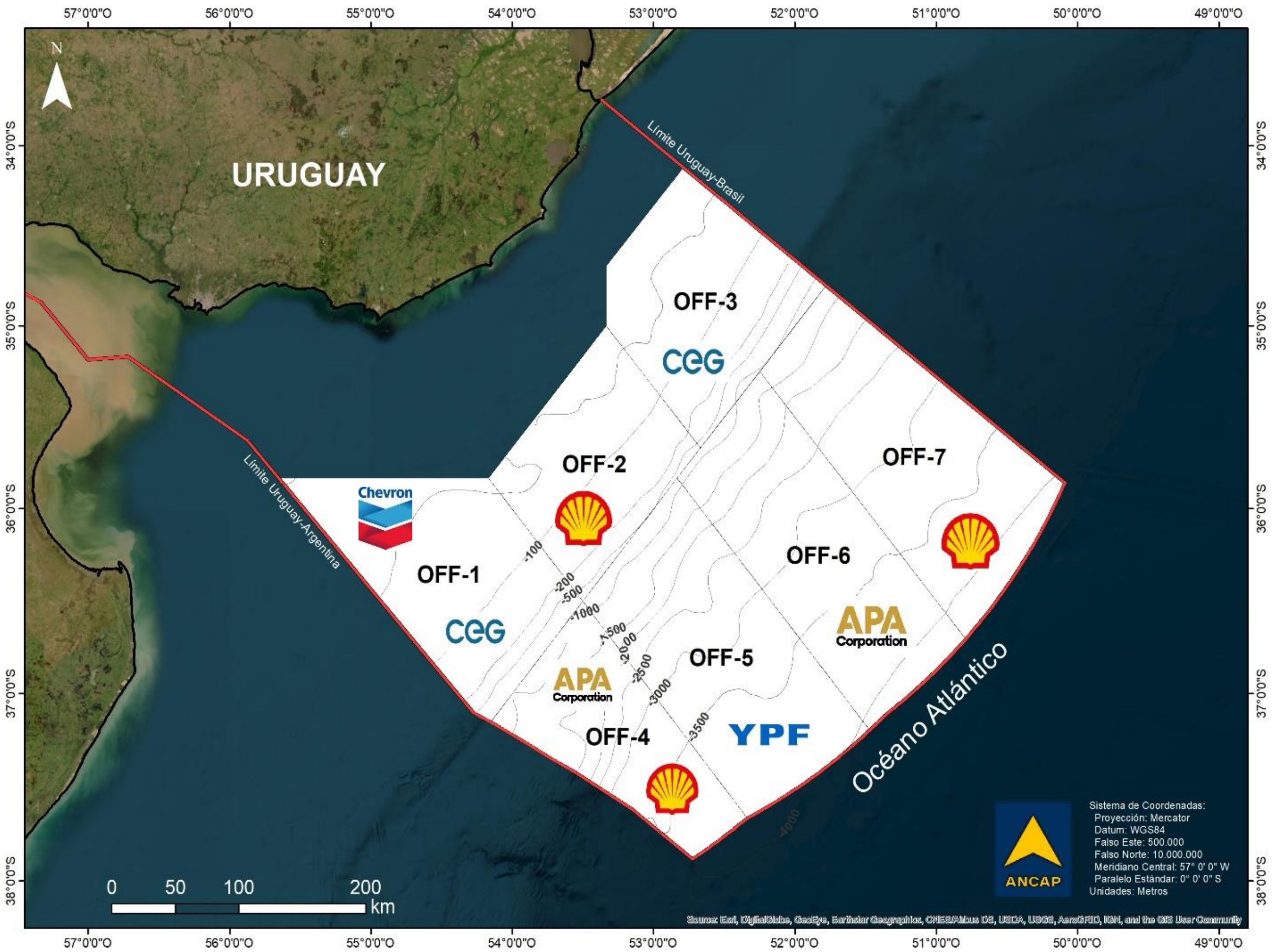




https://geoexpro.com/namibia-looking-at-the-factors-that-cause-concern-when-it-comes-to-developing-the-recent-deep-water-finds/?mc_cid=baa6748fec&mc_eid=190f585a93

All offshore blocks with Contracts in force

Future Exploration Activity includes 3D seismic, a well in block OFF-6 and working with existing data



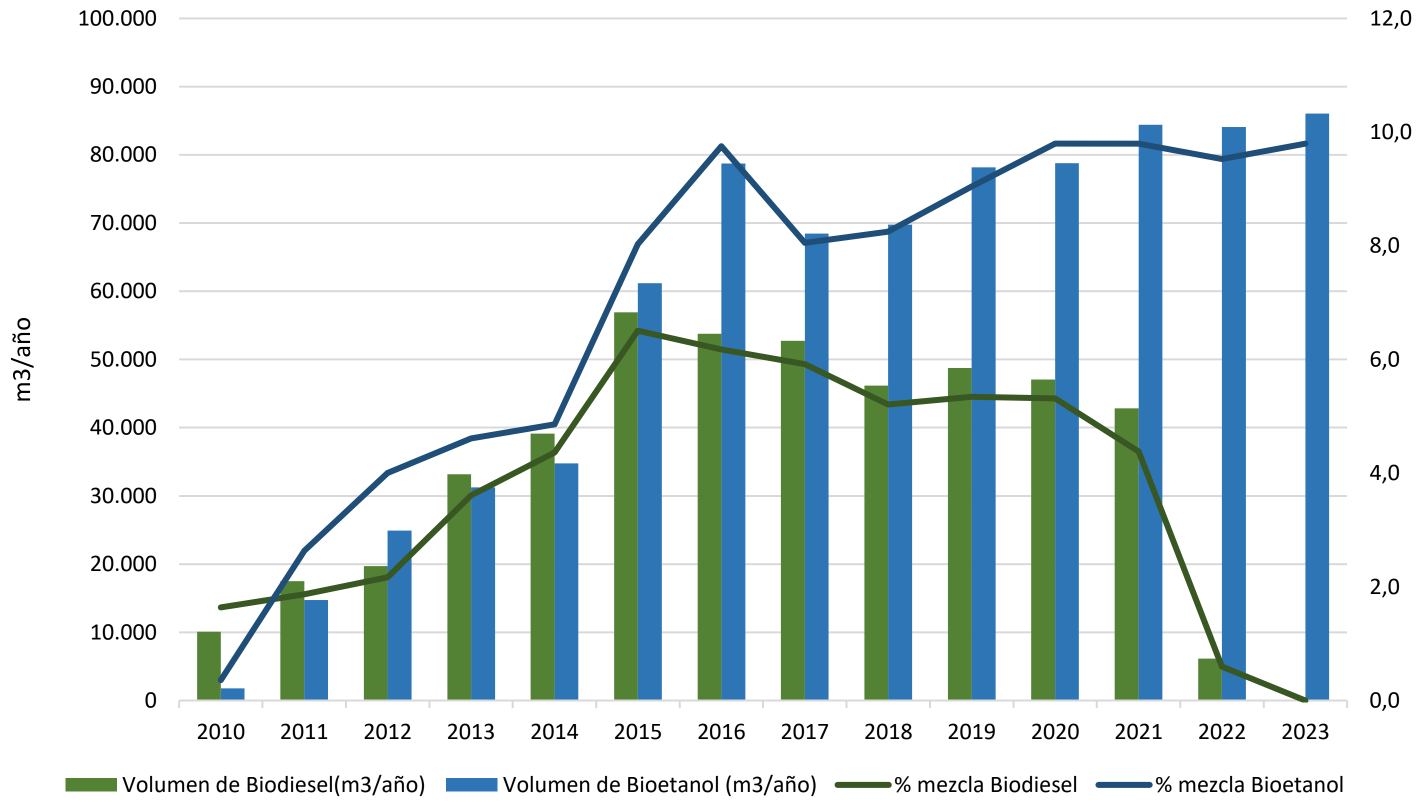
3D seismic

1 exploratory well in Area OFF-6

ALUR

ANCAP in the 1st Energy Transition – 1st stage of production of sustainable molecules

Volume of biofuels sent to blending



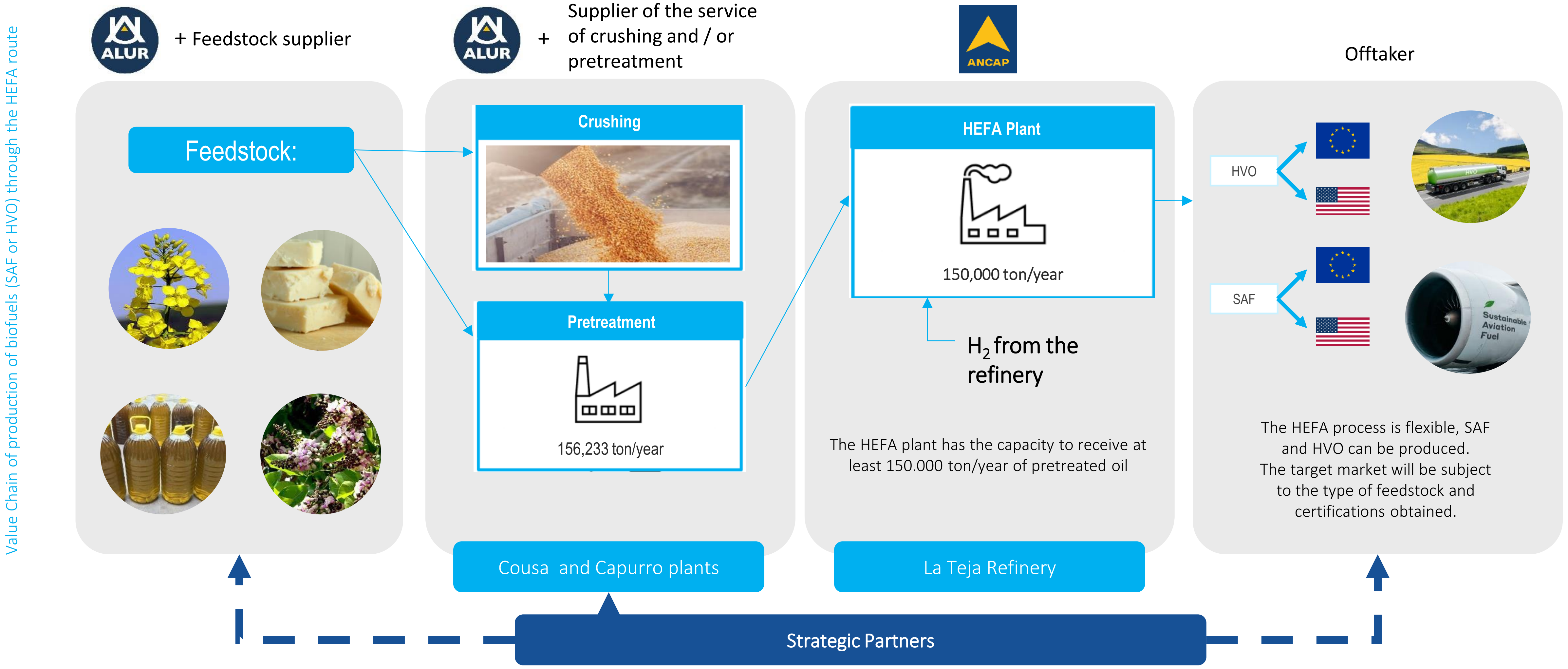
This production has represented a reduction of more than 2,3MMTon of CO_2 emissions.

Which is equivalent to introducing 60,000 EV per year in Uruguay

≈ 800.000 m^3 of Bioethanol and ≈ 475.000 m^3 of Biodiesel

Project to produce HVO / SAF - ANCAP and ALUR

Flexibility of feedstocks, products and markets



Production of e-fuels in Paysandú

HIF Paysandú eFuels Facility

HIF

The HIF Paysandú eFuels facility will be our first project in Uruguay. It expects to produce approximately 250,000 tons per year of carbon neutral eGasoline, with the potential to decarbonize over 150,000 vehicles. It will provide over 3,000 jobs during construction and 300 during operations.

Quick Facts

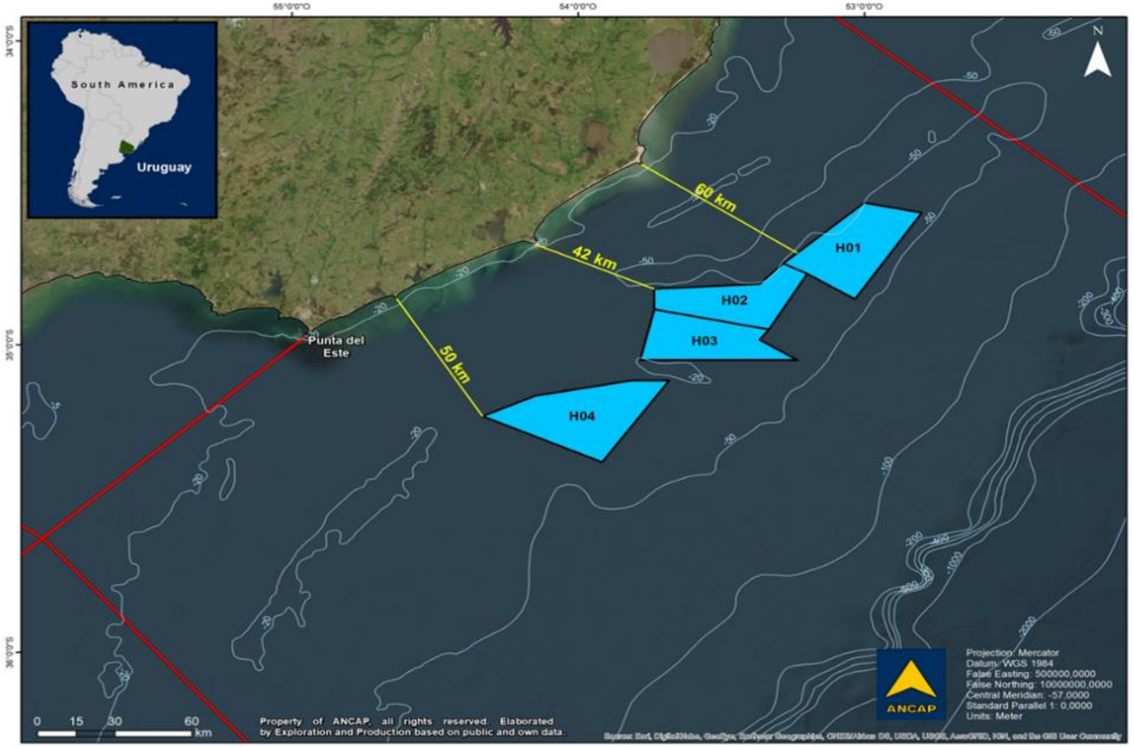
- $US 4 billion investment
- 700,000 tons/year of eMethanol
- 900,000 tons of CO2 captured/year
- 2025 construction date

ALUR Option to participate in the project with up to 30%

H_2U Offshore

H_2 URUGUAY Offshore

Gemini Advanced (2024). Producción de hidrógeno renovable en el mar

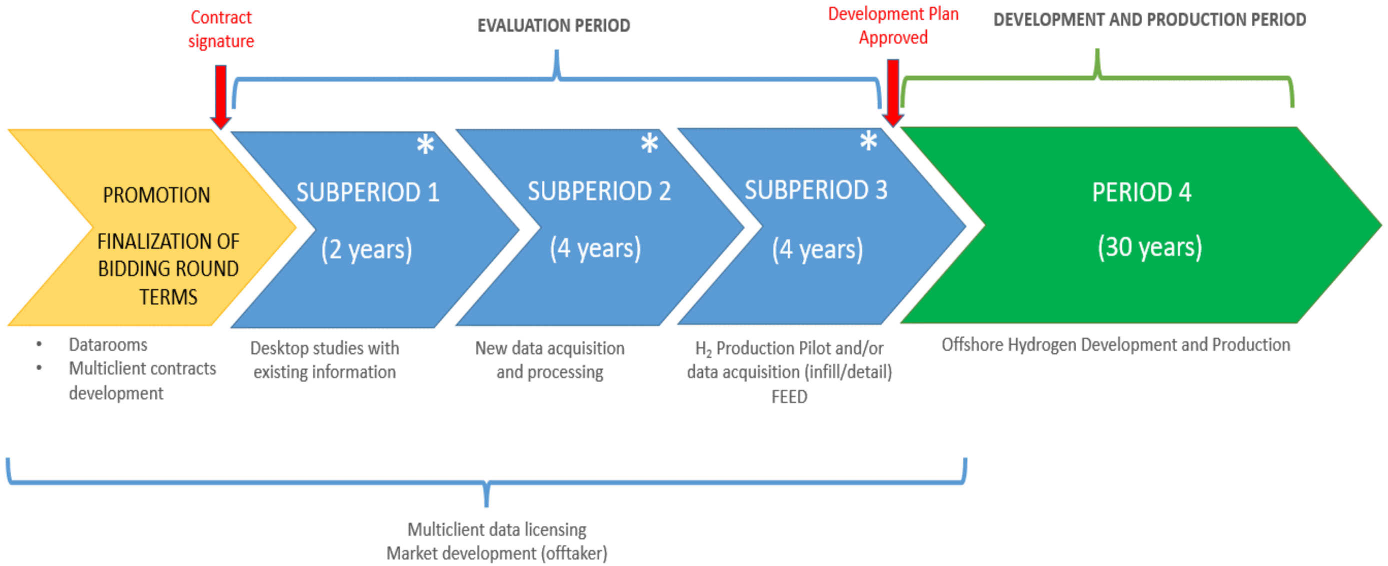


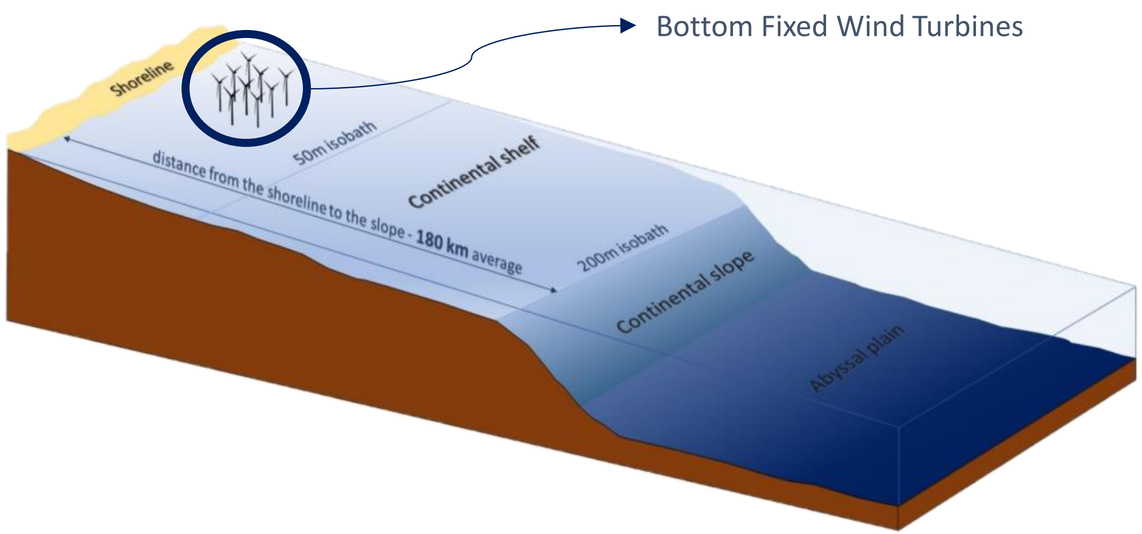
ANCAP is tendering offshore areas for energy companies to carry out feasibility studies and potential installation of infrastructure to produce H_2 from offshore renewable energy, at their own cost and risk entirely.

H_2U Offshore

H2 URUGUAY Offshore

CONTRACT TERMS





FLEXIBILITY for the contractor to propose development concept including:

- Offshore / Onshore Electrolysis
- Project scale (phases)
- Type or H2 Carrier (NH3, LH2, etc)
- Market/Off-taker
- Development committed only after 10 years of evaluation period

Excellent Wind Conditions:

- Large Technical Potential (275 GW)
- High load factors (> 55%)
- Wind speed 9,5 m/s in annual avg (at 100m)
- Slight increase towards south
- Much better quantity, quality, and uniformity than onshore

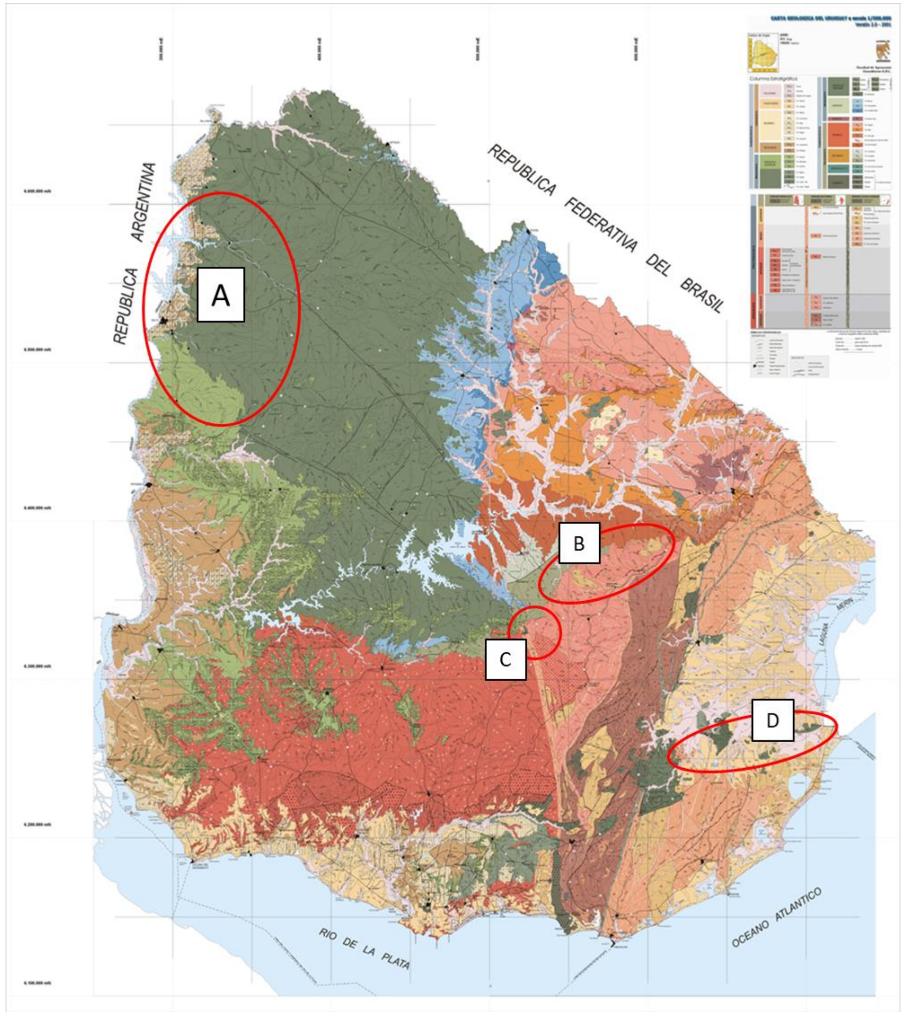
Natural or Geologic Hydrogen

ANCAP's plan to develop this resource

- **<u>Year 2024</u>**
- Understanding H Nat Business
- Training
- Networking
- Research Agreements

- **<u>Year 2025</u>**
- Bidding Round Terms and Contract Model – Send for approval of MIEM
- Multiclient Agreements
- Launching H Nat Bidding Round

- **<u>Year 2026</u>**
- Submission of bids in the H Nat Bidding Round
- Signature of H Nat E&P Contracts



Areas of interest where blocks will be defined

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Reliable supply for the Uruguayan market, at the required quality and quantity, in an affordable and sustainable way

ANCAP

Decarbonization of current operations

We are committed to the reduction of the carbon emissions from our traditional operations and in all our industrial plants.

Hydrocarbons Exploration & Production

First time in Uruguayan history that all the offshore blocks are awarded with E&P contracts.

Take responsibility for the energy transition in Uruguay, leading the development of sustainable molecules that will be increasingly consumed in the coming decades

BioRefinery

ANCAP and ALUR are working to develop HVOs (Hydrotreated Vegetable Oils), which are fuels from vegetable oils, animal fats and used cooking oils (UCOs).

The raw materials will be processed at ALUR's facilities and the HVO produced at ANCAP's La Teja Refinery, through catalytic hydrogenation.

e-fuels

Biogenic CO_2 of ALUR's bioethanol plant in Paysandú will be used for the first e-fuels production project in Uruguay.

H2U Offshore

ANCAP is planning to tender offshore areas for energy companies to carry out feasibility studies and potential installation of infrastructure for the production of H_2 from offshore renewable energy, at their own cost and risk entirely.


LATIN AMERICA & CARIBBEAN
ENERGY SUMMIT
Strategy, Security
and Transition
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