

In the context of energy transition, data mapping on investments in innovation are inputs for strategic decisions in the energy sector. Inova-e is a platform that gathers and categorizes public and publicly oriented investments in Research, Development and Demonstration (RD&D) in energy in the country. In its 2025 update, the investment amounts made up to the year 2024 are incorporated into the platform.

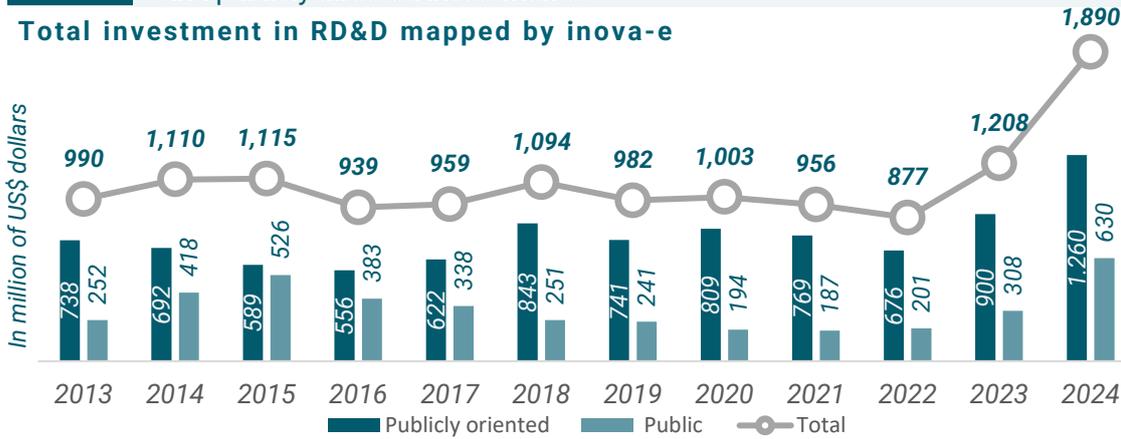
Check out the highlights



1

Investments in 2024 totaled US\$ 1.9 billion, the highest value in the time series. **The 57% growth compared to 2023** resulted from a comparable expansion in both public investments and publicly directed investments.

Total investment in RD&D mapped by inova-e



Publicly oriented investments, such as those reported by ANP and ANEEL, lead the total resources allocated to RD&D. In 2024, they reached almost 67% of the total volume.

In 2024...

Institution	Value (million US\$)	Share (%)
Others	55	2.9%
BNDES	40	2.1%
FINEP	69	8.6%
ANEEL	163	28.3%
ANP	1,096	58.0%

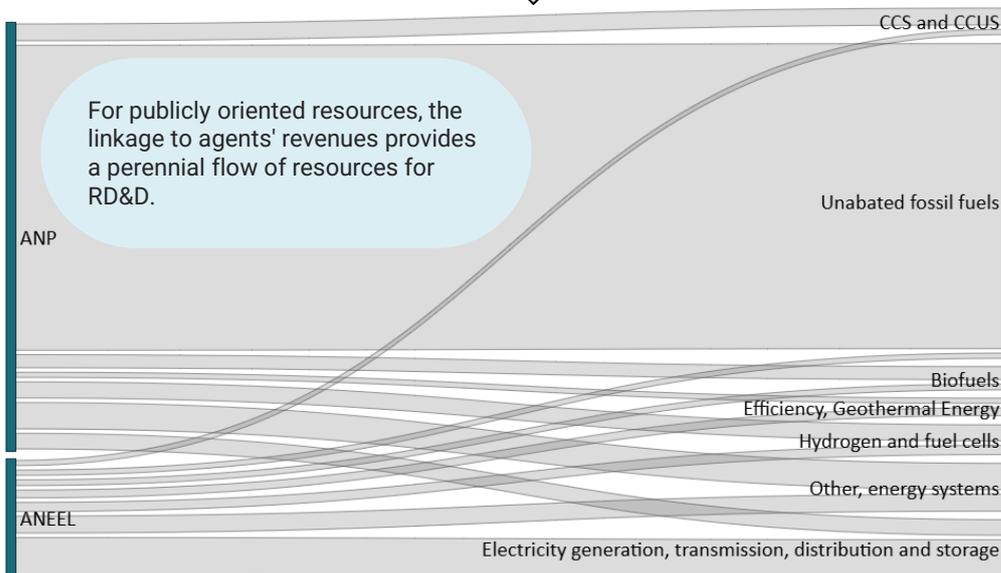


What explains the higher participation level of publicly oriented investments?

The publicly oriented resources result from legal obligations to allocate a percentage of the Net Operating Revenue of companies in the electricity and O&G sectors. Regulatory agencies manage and guide the application of resources, following the guidelines established in **CNPE Resolution # 02 of 2021**, and amendments.



... among publicly oriented resource providers



Currently, there is a predominance of investment in fossil technologies in ANP resources. Such resources are relevant, as they can be directed to low-carbon technologies.



For resources from the electricity sector, a more diversified profile of technologies is observed, with a predominance of low-carbon emission technologies*.

*In this factsheet, only fossil-free technologies were not considered low-emission.

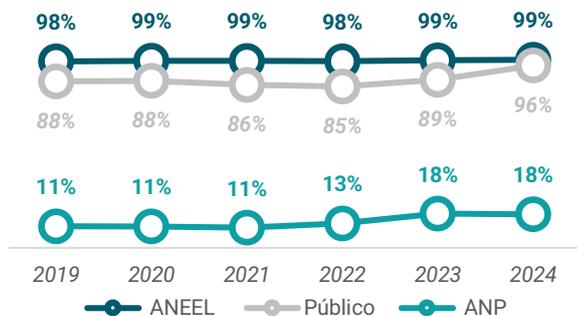
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Despite having a smaller volume of resources, **public funding maintains a focus on low-emission technologies**, such as renewable generation and biofuels.

Share (%) of low-carbon technologies in total investments in RD&D between 2019 and 2024

Public investments and investments from ANEEL's R&D program prioritize low-carbon technologies (89% and 99%, on average). It is observed, in ANP resources, an expansion of low-emission technologies, which now account for 18% of investments.

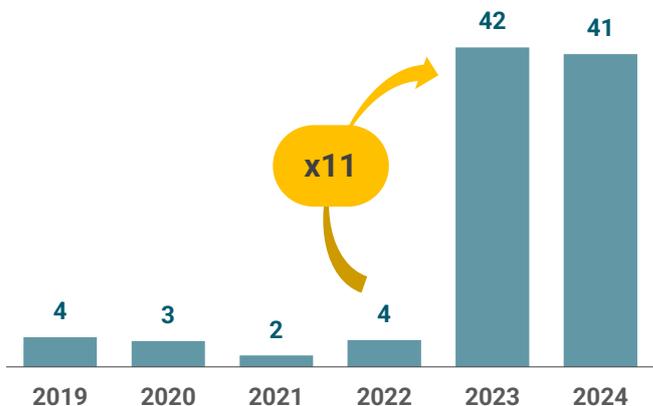
This pathway highlights the importance of strengthening the mechanisms for directing resources to strategic areas of the energy transition.



3

Investments in carbon separation, capture, transport and storage technologies (**CCUS**) sharply increased in the last 2 years. In 2024, they totaled US\$ 41 million, of which **87% were supported by resources from the ANP's R&D program**.

Investments in RD&D in CCUS between 2019 and 2024 (in US\$ million)



Key drivers

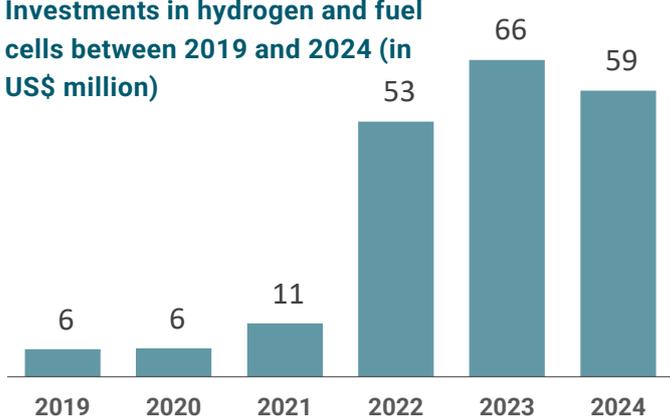
- Carbon capture, use and storage technologies are among the options for the **decarbonization of the E&P segment**.
- Definition, by the Fuel of the Future Law (Law #14,993/2024), the role of the **ANP as the regulator of CCUS activities**.
- Regulatory improvement of CCUS by the ANP** in progress since 2023.

In February 2025, the **National Energy Policy Council amended CNPE Resolution # 02 of 2021** to add CCUS as a priority topic for RD&I financing by ANEEL and ANP. As a result, it is expected that RD&D efforts will be intensified on the subject.

4

Investments in RD&D in hydrogen and fuel cells grew more than 10 times between 2019 and 2024, reaching US\$ 59 million in 2024, assuming a prominent position in the development of RD&D in Brazil.

Investments in hydrogen and fuel cells between 2019 and 2024 (in US\$ million)



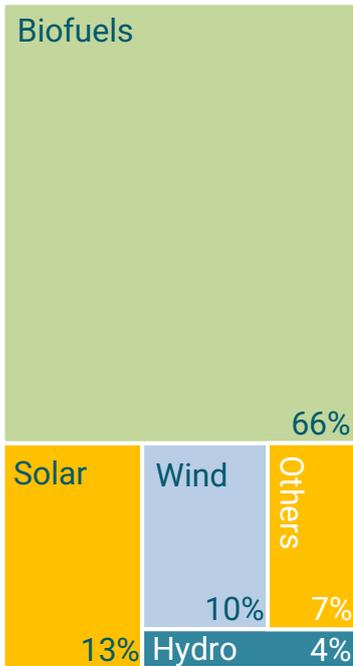
The increase in investments in hydrogen R&D reflects its **prioritization in the innovation and energy transition agenda**, driven by:

- Global trend:** expansion of the hydrogen market since 2020, accelerated by the Russia-Ukraine war.
- Regulatory guideline:** hydrogen as an RD&I priority by CNPE (2021) and by the 2023-2025 Three-Year Plan of the PNH₂.
- Public funding:** specific calls, such as Finep – More Innovation Brazil Program, ANEEL 023/2024 and Finep + BNDES for sustainable fuels.

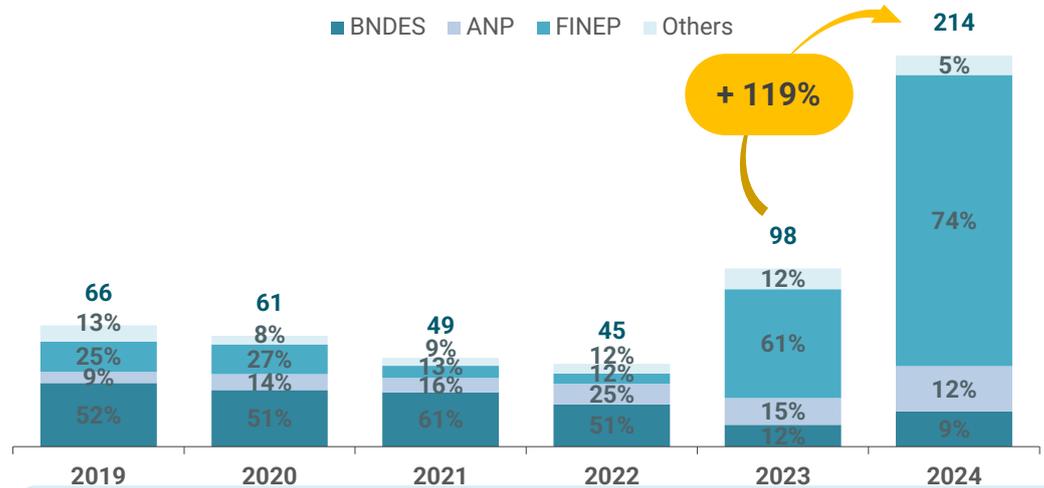
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Biofuels showed the highest growth in RD&D among renewable technologies, with an increase of 119% compared to 2023. Reaching US\$ 214 million in 2024, biofuels accounted for 66% of the application of resources among renewable technologies.

Among renewables....



Evolution of RD&D in biofuels between 2019 and 2024



Drivers of biofuels development

- Possibility of new markets and incentives to produce **second-generation ethanol (2G) and sustainable aviation fuels (SAF)**.
- **Recent public calls** from Finep, BNDES and state agencies that have launched specific lines of support for biofuels.

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The role of the National Energy Policy Council in promoting strategic issues for the energy transition:
CNPE Resolution 02 of 2021 effects

Evolution in RD&D of ANEEL and ANP in US\$ millions

Technology	2021	2022	2023	2024
Hydrogen	7	17	33	46
Nuclear Energy	-	-	-	1
Biofuel	8	12	17	28
Energy Storage	7	4	4	6
CCUS	1	2	19	37
Energy Efficiency	27	20	16	10
Wind power	7	6	17	27

Evolution of total Rd&D investments in US\$ millions*

Technology	2021	2022	2023	2024
Hydrogen	11	53	66	59
Nuclear Energy	17	21	47	102
Biofuel	49	45	98	214
Energy Storage	9	9	8	37
CCUS	1	4	42	41
Energy Efficiency	111	87	85	192
Wind power	7	7	20	32

CNPE Resolution # 02 of 2021 establishes priority strategic areas for the application of R&D resources regulated by ANEEL and ANP. However, it is also important to monitor the contributions of other institutions, which can complement and expand the results in these areas.

*The table of total investment evolution covers the following institutions: BNDES, FINEP, ANEEL, ANP, CNEN and CNPq.

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Stay tuned: spotlight on critical and strategic minerals

Given the growing importance of critical and strategic minerals in the global energy transition, **we will launch a factsheet dedicated to the sector**, focusing on the analysis of investments in RD&D aimed at this topic.





In this factsheet and in the current version of the investment module of the inova-e platform, all values are presented in constant values of 2024. 1 USD = 5,39 BRL

This is the second version of the document, developed in partnership with FINEP, which enabled the expansion of the number of mapped projects and the implementation of methodological improvements.



Click here to access the platform:



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