

DONG to Ørsted: Seven Insights to Transform National Oil Companies

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APRIL 2025

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Summary

The experience of Denmark's national oil company (NOC) DONG transforming into Ørsted, the world's leading offshore wind developer, is a case worth exploring. While aspects of Denmark's story are unique and not easily replicated, many of the underlying lessons can apply elsewhere. The table below summarizes insights from the DONG-to-Ørsted experience and draws out takeaways for other countries and NOCs considering such a transformation.

	Insights from the DONG case	Takeaways for other countries and national oil companies (NOCs)
1	An energy security crisis, not environmental concern, sparked political agreement that led to sustained policy support for wind energy in Denmark	Energy security concerns can represent an opportunity to build support and consensus for credible transition policies and NOC transformation
2	State ownership of DONG facilitated long-term commitment to wind energy, while stable policy-making guided companies in making ambitious investments	NOC transformation is more likely where governments set credible and stable long-term goals aligned with transformation; this can include policies that make state support conditional on investment in specific sectors like renewables
3	A "low-tech" wind power industry provided the technological base for the transformation of DONG	NOC transformation ideally leverages an existing technological and industrial base; it is possible to create the technological base for NOC transformations even starting from "low-tech" foundations, but this takes time; so governments and NOCs should start early and accelerate efforts wherever possible
4	DONG used its advantages in geography and in skills transfer to wind energy	Not all NOCs should aim to become renewable energy companies; each NOC should examine its own comparative advantages based on geography and industrial capabilities, which may differ for different NOCs
5	New investor profiles, such as pension funds, were attracted to DONG because of wind energy's stable returns and environmental benefits	NOCs looking to transform should align with the investment and financing context and trends; for example, they can look to finance their transformation via opportunities from investors such as pension funds and development, green and multilateral banks interested in renewable energy and other green sectors
6	The transformation of DONG did not mean the end of oil revenues or of state participation in the sector	Governments need not view NOC transformation as the end of the oil and gas sector in the country or the end of state revenue from, or participation in, the sector
7	Significant job creation and a decades-long just transition policy supported DONG's workers	NOCs should gauge the similarity between skills developed in fossil fuels and those needed in future industries for a just transition, especially in low- and middle-income countries without comprehensive just transition policies or extensive social security and welfare provisions

Introduction

Governments in oil- and gas-exporting countries have long worried about two things: the eventual depletion of reserves and the volatility of global oil and gas prices. In response, many have acknowledged the need to diversify their economies beyond fossil fuels—to create new industries, generate jobs, stabilize government revenues and earn foreign exchange. Yet, despite decades of ambition, few have managed to succeed. And now, the urgency is growing in light of the global energy transition, threatening long-term demand for oil and gas.

This shift has not only pushed governments to rethink their economic strategies but also forced national oil companies (NOCs)—along with their private-sector counterparts—to outline their own diversification plans.[1] While these corporate efforts may not be sufficient on their own to shield a country from the impact of declining demand, they matter. Understanding how NOCs attempt to diversify can help governments determine whether these strategies support or undermine broader economic goals.

There are reasons to be cautious. Diversification by NOCs could end up wasting public resources if, for example, NOCs invest in poorly planned ventures, politically motivated projects or sectors where the company lacks expertise. Worse, if such efforts are not carefully aligned with national development and decarbonization goals, they can divert capital and attention away from other priority areas.

History offers few examples of successful oil company transformations. Most international oil companies failed in their diversification attempts during the 1980s—often expanding into unrelated sectors with little strategic coherence—and their recent ventures into renewable energy have also yielded underwhelming results.

So where should leaders in governments and NOCs look for inspiration?

One compelling case is Denmark's former national oil and gas company, DONG. Rather than simply diversifying its portfolio, DONG undertook a bold transformation. It exited oil and gas entirely, phased out coal, and reemerged as Ørsted—the world's leading offshore wind developer, operating across the entire wind value chain (Figure 1). In the process, it did more than secure its own future. It catalyzed the growth of Denmark's wind industry, enhanced the country's export base, supported government revenues, and strengthened Denmark's global influence on climate and energy diplomacy.

This briefing describes DONG's transformation into Ørsted, drawing out key insights for other countries. Some aspects of Denmark's story are unique and not easily replicated—rooted in its geography, politics and existing technological base. But many of the underlying lessons can apply elsewhere. This story can help leaders in other countries decide whether and how their NOCs should diversify and potentially transform into new businesses.

DONG's transformation from petroleum to wind and benefits for Denmark

As DONG transitioned from fossil fuels to renewables, it steadily increased investment in wind energy while scaling back spending on oil and gas exploration and thermal power (Figure 2). By 2011, the company was reporting consistent income from its wind portfolio, supported by favorable government subsidies. That year, 59 percent of DONG's capital investment went into wind. After global oil prices plummeted in 2014, DONG doubled down on its renewables strategy, channeling nearly all of its investment into wind projects. The company completed its exit from the fossil fuel sector in 2017 by selling its entire oil and gas business—including petroleum licenses in Denmark, Norway and the UK—to the private firm INEOS. The transformation of DONG into Ørsted delivered clear benefits to Denmark—visible in growing fiscal contributions and a radically transformed electricity system.



Figure 1. Timeline of DONG's transformation into Ørsted

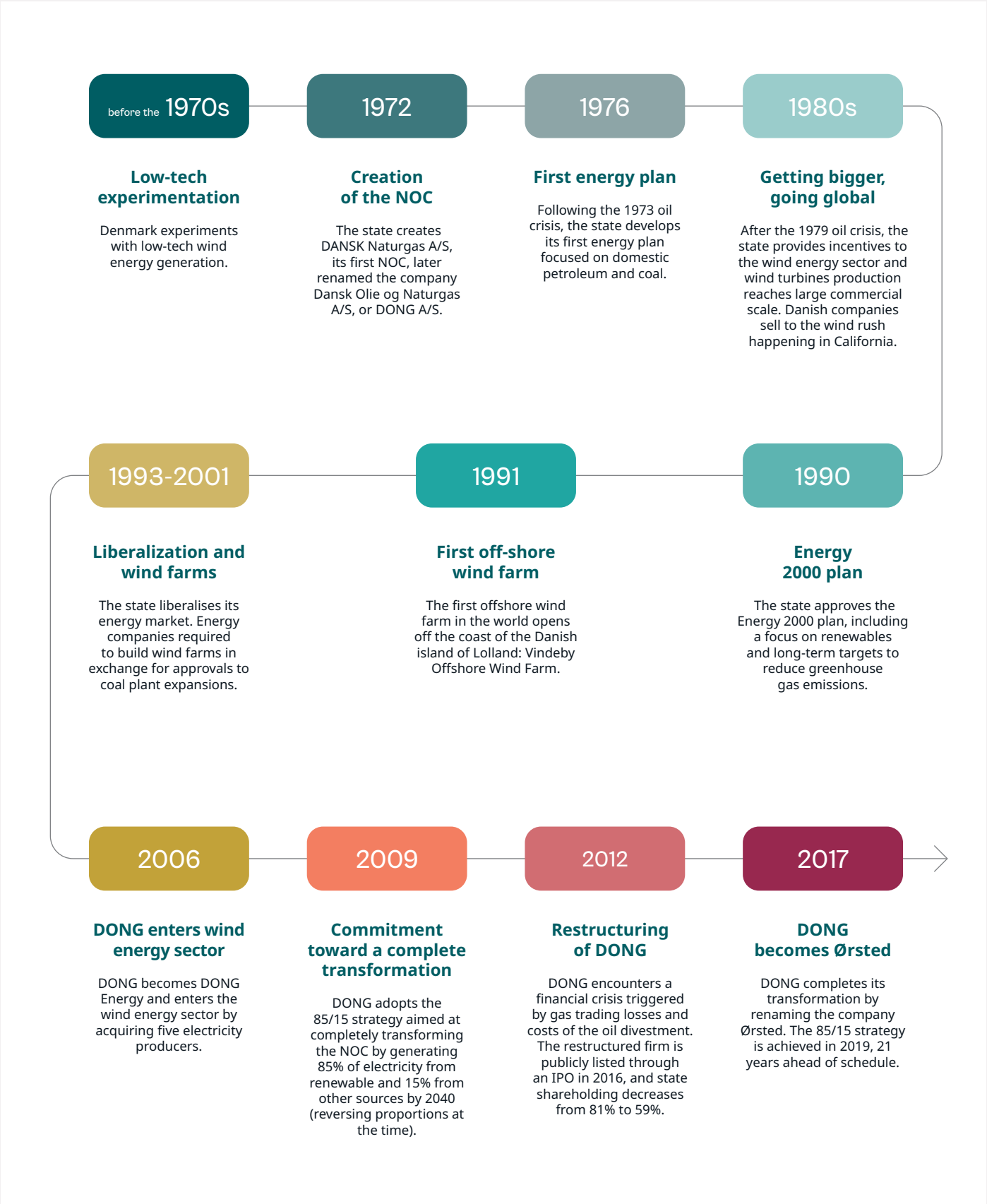


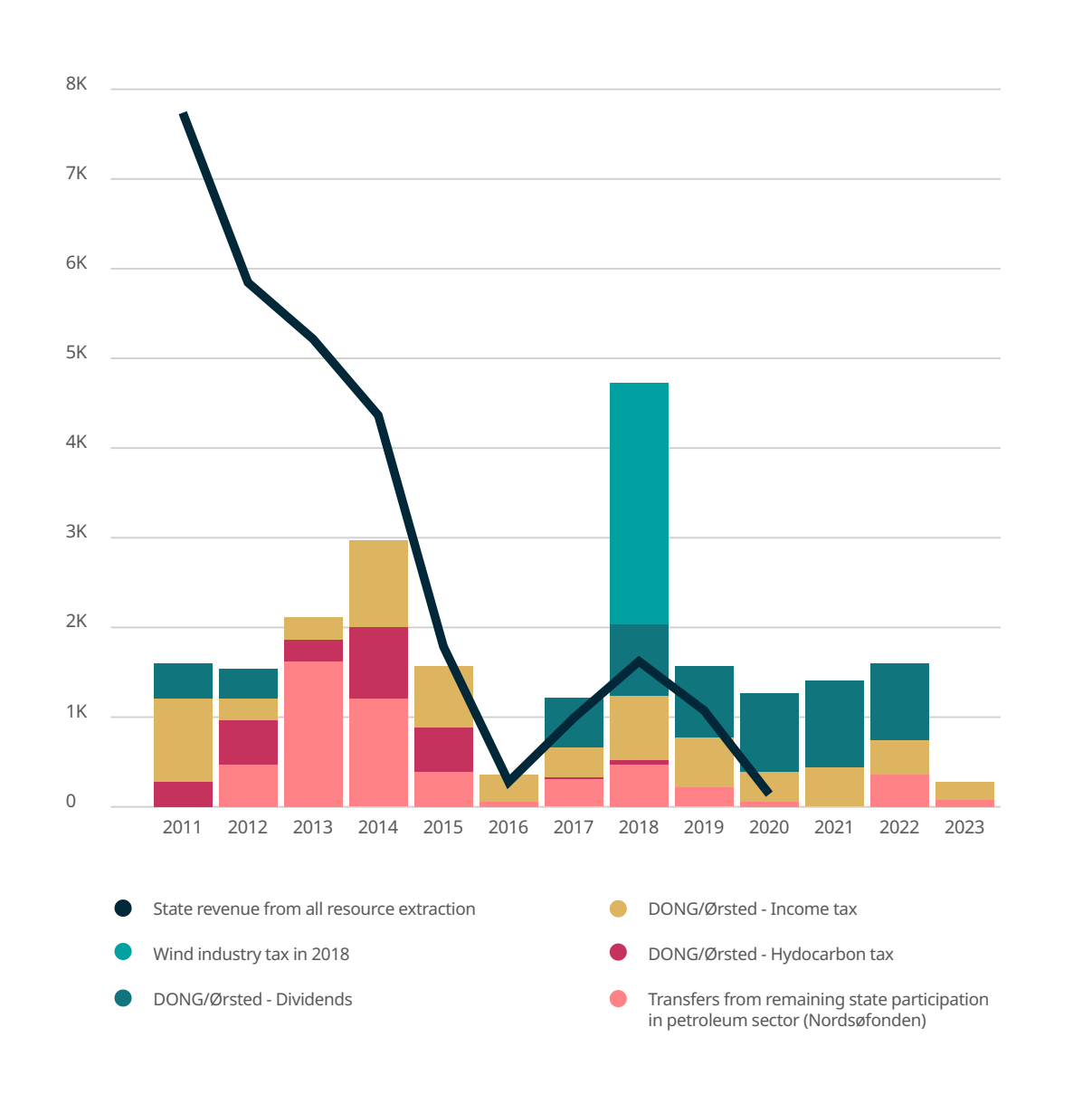
Figure 2. DONG Energy and Ørsted's investment by business area



Sources: DONG Energy and Ørsted's annual reports. Excludes investment in sales & distributions, customer solutions and customers & markets

Strengthening government revenues. Although Denmark was never heavily reliant on oil and gas revenues, DONG's transformation into Ørsted still played a role in strengthening and diversifying government income as domestic oil reserves declined and global petroleum prices fell. From 2017 to 2023, Ørsted paid out large, stable dividends to the state and contributed significantly through taxes—far exceeding what the Danish government received from its remaining interests in the upstream oil and gas sector.[2] These returns suggest that Ørsted, and the broader wind industry it helped catalyze, may have replaced dwindling revenues from the wider upstream oil and gas industry. While data on subsidies for the two industries is limited, 2018 figures (the only year with available tax data for the wind sector) show that tax contributions from wind energy helped offset reductions in oil and gas revenues (Figure 3).

Figure 3. Danish national oil and wind companies' payments to the Danish government
(USD million, 2024 prices)



Sources: Nordsøfonden; ICTD/UNU-WIDER Government Revenue Dataset

Transforming electricity supply. Ørsted has also played a central role in Denmark's dramatic shift toward renewable electricity. The company's investments have contributed to Denmark achieving the highest share of electricity from wind energy in the world, significantly reducing dependence on imported petroleum. This transformation has enhanced both energy security and climate leadership.[3]

Seven insights

1. An energy security crisis, not environmental concern, sparked political agreement that led to sustained policy support for wind energy in Denmark

Long before Denmark reached political consensus in the 1990s to reduce greenhouse gas emissions, the energy crisis in the 1970s sparked nationwide support to develop renewable energy. Surging oil prices during the 1970s raised concerns about Denmark's dependency on imports.

Denmark's first energy plan in response to the first oil crisis of 1973 focused on reducing oil dependence by switching to coal and developing more domestic oil and gas production.[4]

However, it was the second oil crisis of 1979, together with further technical developments in the wind sector, that led Denmark to begin subsidizing its wind energy. The crisis also promoted small-scale wind energy projects as a cost-saving measure.[5]

Subsidies for renewable energy and other measures supporting low-carbon energies later gave DONG and the cluster of wind energy companies in Denmark the confidence to make long-term commitments to wind energy.[6]

2. State ownership of DONG facilitated long-term commitment to wind energy, while stable policy-making guided companies in making ambitious investments

A key factor differentiating Denmark's approach to the energy sector from that of other countries was the reliability and stability of its energy policies. Unlike in many countries where energy policy is fragmented or politicized, Denmark's approach has been remarkably consistent. Successive governments reviewed national energy "agreements" roughly every five years, building each new policy on the foundations of the previous one. This staggered approach created policy continuity, reinforcing investor confidence and providing a clear trajectory toward decarbonization. Notable milestones in this process include the Energy 2000 plan (1990), the Energy 21 plan (1996) and the Danish Energy Agreement (2008).

During the 1990s, Denmark liberalized its energy market—but with strategic policy conditionalities. Svend Auken, the Danish Environment Minister from 1993 to 2001, mandated large wind projects as a condition for agreeing to coal power plant expansions. Utilities seeking to build coal-fired power plants were required to develop large-scale wind projects, thereby creating those wind energy capabilities in utilities that later benefited DONG when it acquired five of those utilities in 2006.[7] This created space for experimentation and competition among electricity producers, helping to accelerate the scaling of wind power. Meanwhile, policies encouraging local ownership of wind projects reduced public resistance and supported the expansion of onshore wind.

Incentives were also crucial. Denmark introduced fixed feed-in tariffs, market premiums, installation and price subsidies, and dedicated research and development (R&D)

funding. The 2008 Energy Agreement, for instance, committed USD 201 million annually to energy research and demonstration projects and added a price subsidy of USD 0.03/kWh for wind and biomass energy.[8] For its first offshore wind tender, Denmark adopted a model based on open dialogue between policy-makers and industry, helping to build trust and improve bid design.[9] However, recent policy changes—particularly in the bidding system and state guarantees—undermined investor confidence, leading to the failure of Denmark's 2024 offshore wind tender.[10,11]

The government also set a clear and measurable goal for DONG to diversify: the 85/15 goal. In 2009, DONG generated 85 percent of its energy from fossil fuels and 15 percent from renewable energy. The goal was to reverse these percentages by 2040. Ørsted reached this goal 21 years early, in 2019. Given the direct influence that states can exercise over national companies thanks to their ownership stakes and presence on the board, state ownership facilitates the implementation of long-term goals beyond profitability, including energy security or climate goals.[12]

This policy stability was not just driven by the government. Broad-based political consensus was needed to ensure successive governments provided consistent support across the decades. Strong trade union membership and cooperation between the government, unions and business organizations helped align their goals with the nation's energy transition goals. Denmark's experience shows that transforming a national oil company requires a whole-of-society commitment to economic and energy transformation.

3. A "low-tech" wind power industry provided the technological base for the transformation of DONG

Denmark's wind energy sector may be globally dominant today, but it began with humble, low-tech origins. Danish experimentation with wind power dates back to 1881, but it wasn't until the oil crises of the 1970s that the country began seriously developing modern wind technology. Unlike Germany or the United States, where larger firms and government R&D programs led the way, Denmark's early wind industry was driven by grassroots initiatives and small companies using relatively simple, small-scale turbines (or "low tech") with little initial investment in R&D.[13]

Still, this early start laid an industrial foundation that proved vital. By the late 1970s, Denmark was producing its first commercial wind turbines. Through the 1980s, these machines became increasingly efficient and scalable, aided by the surge in global demand during California's "wind rush."[14] Denmark also invested in complementary capabilities—such as wind mapping, marine spatial planning and transparent public data—which helped Danish firms expand internationally.[15] In 1991, Denmark was the first country to build an offshore wind farm—Vindeby Offshore Wind Farm—near the Danish island of Lolland. From this initial industrial cluster in wind energy, DONG started to acquire companies to compete against other large multinational electricity companies, and to improve DONG's attractiveness to raise more capital through an initial public offering.

In 2006, DONG renamed itself DONG Energy and acquired five electricity generation and supplier companies: Elsam, Energi E2, Nesa, Copenhagen Energy and Frederiksberg Forsyning. These acquisitions involved transferring about 3,500 employees from the other companies with skills in offshore wind projects, and reduced the state's ownership of DONG as shareholders of Elsam and Energi E2 exchanged their shares for shares in DONG Energy.[16,17]

4. DONG used its advantages in geography and in skills transfer to wind energy

Operating in the North Sea benefited DONG in three ways.

First, the North Sea's wind potential and its reliability as one of the windiest areas in the world gave the natural conditions for a profitable wind industry and for DONG and the industry cluster to attract financing.[18]

Second, a large portion of Denmark's oil industry was offshore in a notoriously rough and stormy sea. This forced the company to excel at constructing offshore petroleum projects and this expertise carried over into constructing offshore wind platforms.

Third, the North Sea is surrounded by one of the most densely populated and wealthiest regions in the world, allowing Ørsted to derive 78 percent of its sales revenue from outside Denmark, mostly from the UK.[19] Long-term subsidy programs in Germany and the UK, two of the largest electricity markets surrounding the North Sea, also provided a large and dependable market for Ørsted sales. In 2019, the Danish wind energy industry constituted more than half of the country's exports.[20]

These geographical factors may not be available for other NOCs. The main transfer of skills for DONG was from the offshore part of the petroleum industry to the offshore part of the wind energy industry. However, many NOCs are not petroleum operators but instead invest state capital as minority non-operating join venture partners, regulate the industry and manage fiscal payments; and fewer have offshore capabilities. Nor are there many NOCs in countries with significant offshore wind energy potential. Brazil's Petrobras and Norway's Equinor are exceptions—both of which are developing offshore wind businesses.

Instead, NOCs will have to exploit advantages in their own geography and industrial capabilities, which might be in sectors far removed from offshore wind energy. For instance, some NOCs have other transferable skills—such as trading, partnering with multinational companies and contracting on complex projects. Geothermal energy requires geological knowledge and management that might require similar skills to the onshore petroleum industry. In many countries, NOCs are the largest firms and employ the best engineers, making the participation of the NOC or at least its staff necessary for any type of industrial transformation in these countries.

5. New investor profiles, such as pension funds, were attracted to DONG because of wind energy's stable returns and environmental benefits

Far from deterring investors, DONG's transformation helped attract a new wave of investment. In 2012, DONG still had its oil and gas business, but in that year the company lost substantial amounts in trading gas, prompting DONG to adopt a new plan.[21],[22] Danish pension funds ATP and PFA and the investment bank Goldman Sachs.

The state's ownership in DONG fell from 100 percent to 81 percent in 2006, after the acquisitions, to 59 percent after closing the deal in 2014 wind business was crucial in attracting investors.

DONG's ability to attract new investors involved the following factors.

First, Denmark's long-term policy of subsidies, the reliable wind potential in the North Sea, and the greater stability of electricity prices compared to crude oil and gas prices offered investors more stable returns. This was particularly attractive to pension funds, which require stable returns to fulfill their investment mandates.

Second, investors were attracted to DONG's recently developed capabilities in wind energy production. In 2013, the chairman of the company's board of directors stated that new investors were attracted to DONG "because we have succeeded in building up two strong business units in offshore wind and oil and gas production."[23]

Third, DONG gained the confidence of otherwise cautious institutional investors by developing a "farm down" model for offshore wind projects. Under this model, DONG sold stakes in offshore wind projects after securing permits, contracting offtake agreements and signing construction contracts—essentially de-risking the project before bringing in co-investors. This allowed DONG to recycle capital earlier in the project lifecycle, reducing exposure, and enabling faster loan repayment and dividend payments. By replacing high-risk development capital with lower-cost operational capital, DONG made offshore wind more attractive to cautious institutional investors.

Fourth, DONG's wind business offered benefits to investors that needed more than just financial profits, such as protecting the environment, benefiting society and guarding against corruption. Besides the aforementioned pension funds, development, green and multilateral banks also invested in DONG's wind projects. Starting in 2007, the company received loans from the European Investment Bank (EIB), complementing previous loans for gas projects from this institution. In 2019, the EIB ended fossil fuel project financing but, because of DONG's wind business, continued to lend to the company, including a USD 1.3 billion loan in 2023.[24,25] Green banks were another source of funding.

In 2014, the UK Green Investment Bank became co-owner of DONG's Westermost Rough offshore wind farm.

After the collapse in the oil price in 2014, the company's leaders acknowledged the need to further reduce its investment in oil and gas extraction.[26] Having already attracted equity and debt financing, DONG went further by listing shares in 2016. Here too, DONG's new wind portfolio was crucial. Allocating most of the company's investment to wind before an initial public offering reduced risk and made the company more attractive to those institutional investors that are mandated to invest in lower-risk investments like renewable energy.[27] The sale of shares resulted in DONG being valued at about USD 19 billion in today's money.[28]

For NOCs in the Global South, these types of finance matched with a renewable energy portfolio could offer substantial benefits. Multilateral financial institutions offer more favorable loan terms and longer maturities than commercial banks. A transformation toward green sectors, not limited to renewable energy, might enable NOCs to continue accessing financing, especially if financing for fossil fuels becomes too expensive and harder to obtain. International organizations and overseas development assistance will also favor Global South countries aiming to transform their economies and energy sectors. For example, Pertamina (Indonesia's NOC) has signed a loan agreement worth USD 50 million with the Japan Bank for International Cooperation under the bank's "GREEN operations" facility.[29]

While such investor profiles offer promising opportunities for developing countries, however, such finance still does not fully match developing countries' needs, and the most recent developments may impact the availability of official development assistance (ODA). A notable recent example of a decline in ODA is the cancellation of USAID's Power Africa program, which has helped 216 million people gain access to electricity.[30] However, other initiatives like the multi-donor Sustainable Energy Fund for Africa, the EU-funded ElectriFI program, and the World Bank and African Development Bank's Mission 300 remain in place.

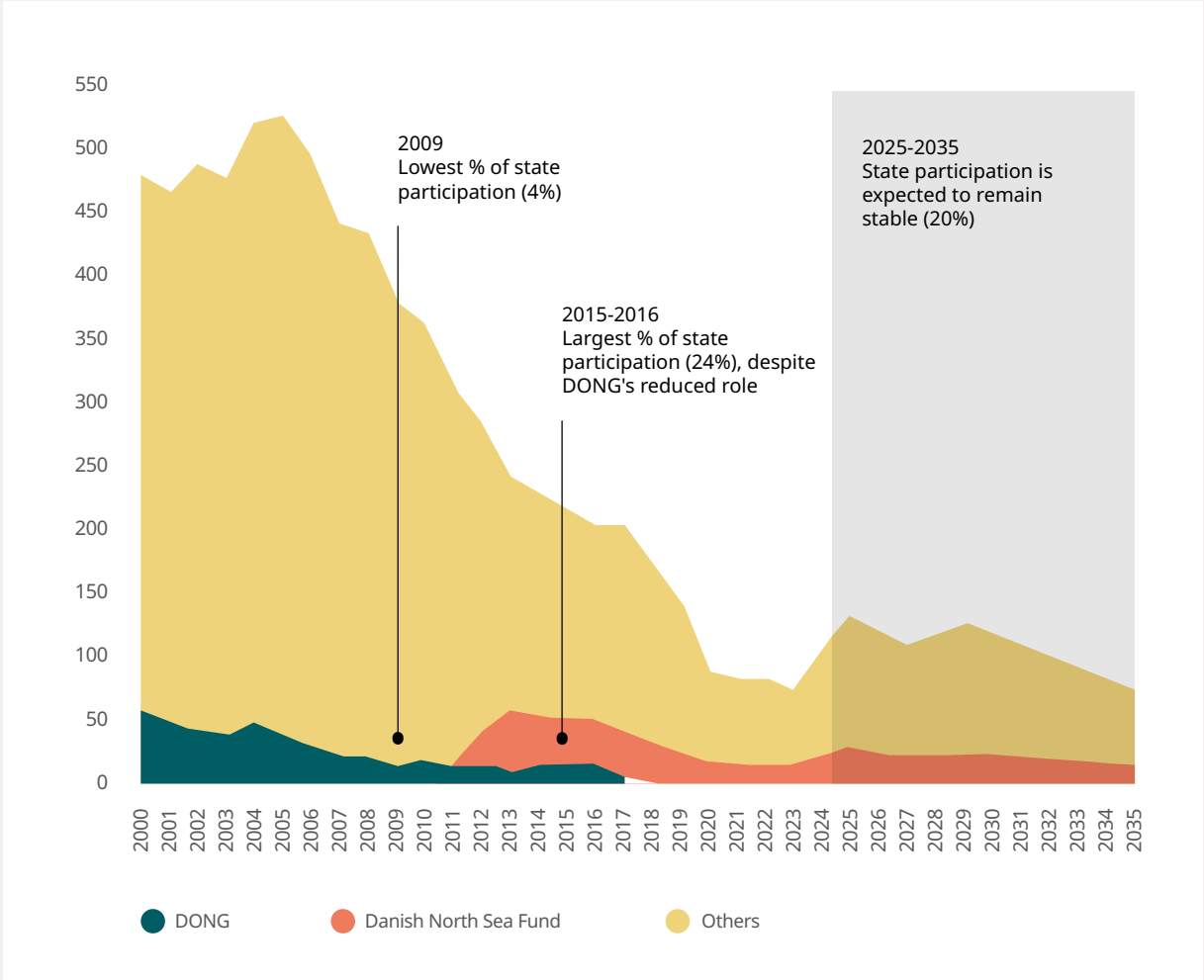
6. The transformation of DONG did not mean the end of oil revenues or of state participation in the sector

The change of name from DONG Energy to Ørsted in 2017 signaled the divestment of the company's oil and gas extraction and trading business.[31] However, the Danish state continued to own oil and gas projects; and Denmark continued to extract its declining oil and gas reserves.

After 2017, the state continued to participate via the Danish North Sea Fund (Nordsøfonden). The North Sea Fund was established by a parliamentary decision after the partial privatization of DONG Energy in 2005. By law, the fund owns between 20 and 40 percent (with exceptions) of all post-2004 Danish oil and gas licenses.[32,33] Figure 4 shows the participation of the two Danish NOCs in oil and gas production since 2011, and DONG's participation from 2000. Denmark's oil and gas production has fallen since 2004, although the fund's participation relative to total production has risen.

Denmark still aims to maximize value from its declining production, but there is a clear deadline against which to do it. The state has tasked the fund to ensure "that as much as possible of the value of Danish oil and gas production is realized before 2050," a date set in 2020 by the Danish government and parliament to phase out fossil fuel extraction.[34]

Figure 4. Oil and gas production in Denmark by ownership[35] (Thousand boe/d)



Source: Rystad Energy E&P Dashboard

In 2022, the Danish state chose the North Sea Fund to be its participant in all carbon capture and storage (CCS) licenses and, in the following year, the fund made its first CCS investment. The fund aims to focus on carbon dioxide storage using Denmark's underground potential and to extend the life of oil and gas infrastructure by retrofitting it to transport and store carbon dioxide.[36] Other countries might note the clear separation in focus between the two NOCs: DONG went into the wind business, and the North Sea Fund has gone into CCS. This separation between renewable energy and a petroleum business that engages with CCS may be a useful example for other oil-producing countries.

7. Significant job creation and a decades-long just transition policy supported DONG's workers

As DONG expanded its wind energy business, employment in this area grew dramatically. In 2011, just 20% of DONG's workforce—about 1,200 employees—worked in wind energy. By 2025, nearly the entire global workforce of 8,905 people was employed in offshore wind.

In 2023 (the latest year in which we have data available), the Danish wind industry directly employed an estimated 16,460 people;[37] and in 2010, it supported a total of 90,500 full-time jobs,[38] almost 3 percent of total Danish employment.[39] A substantial increase from 2009, when 6,500 indirect jobs were in the wind industry.[40] This more than offset the loss of employees from the 2015 decision to divest from oil and gas, with 440 employees in that sector transferred to INEOS in 2017.[41]

Many people employed in DONG's oil and gas divisions initially resisted the company's plan.[42] However, management offered employees the opportunity to transfer into the wind energy unit, in positions that required similar skills to the offshore oil and gas business.[43] The company needed to focus only on internal training since Denmark already had a just transition policy for people employed in the wider oil and gas industry. This policy began in the 1980s, supported by welfare policies such as unemployment insurance, social pensions, retraining programs and vocational education.

In addition, some of the country's oil and gas supply chains were repurposed toward wind energy. Once reliant on the oil and gas industry, Port Esbjerg has since been converted to handle the shipping of offshore wind turbines.[44]

In most other countries with NOCs, except for Norway's Equinor, such social protection may be rare. But governments can at least start their just transition programs as soon as possible and look to obtain financial support for the same. Denmark started its program decades before the final transformation of DONG.

Takeaways for other national oil companies

The transformation of DONG Energy into Ørsted is a compelling story of how an NOC can move into renewable energy. However, this path is neither simple nor universally applicable. Context-specific factors—such as geography and long-term policy frameworks, with stable subsidies in Denmark and the larger electricity markets in Germany and the UK—helped DONG to transform.

Nevertheless, this story is also one shaped by low-tech experimentation, political decisions driven by external events and energy security shocks, and top-down policies (such as the policy conditionalities that created the first large wind power plants). It may therefore be useful for other countries' NOCs.

The story offers some helpful takeaways for government and NOC leaders:

1. Danish leaders were more concerned about a decline in production and energy security than a decline in demand. As a result, they implemented policies and initiatives decades before DONG ultimately transformed into Ørsted. This may be relevant for countries like Colombia and Mexico facing similar declines.

2. NOCs can benefit from their government setting credible long-term goals. For DONG, this came in two forms. The state set DONG the 85/15 goal, a clear metric to measure how the company diversified its business. The state also set a deadline by which Denmark must phase out petroleum production, and the state has given the North Sea Fund a deadline by which to maximize value from the remaining production.

3. Denmark was not at the top of the technological ladder when it started its energy transformation, but rather developed its wind power sector from the ground up, beginning with low-tech experimentation. This gives some hope to countries lacking in technological know-how. DONG later benefited from this "low-tech" foundation laid in Denmark decades before.

4. Governments and NOCs should examine their own comparative advantages based on their geography and industrial capabilities, as these may differ for different NOCs. This means that the best transformation strategy may not be in wind or even in renewable energy.

5. NOCs with limited access to capital, and governments with less fiscal space to subsidize renewable energy, might explore the opportunities given by a new class of investors interested in green sectors, which includes institutions that offer a more patient approach to returns (such as pension funds and development, green and multilateral banks).

6. NOC transformation toward renewable energies does not necessarily mean ending the direct exposure of public capital to fossil fuel assets, as the Danish state continued investing in the oil and gas sector through the North Sea Fund even as DONG transformed into Ørsted. This indicates that, in reducing exposure of public capital to transition risk, governments may still receive revenues from, and participate in, the oil and gas sector.

7. In the absence of Danish-style social security and welfare provisions, leaders will have to carefully consider the just transition for workers, including by gauging the similarity between skills developed in fossil fuels and those needed in new industries.

Finally, governments should not take for granted that renewable energies are their NOC's best way to transform. NOC involvement in renewable energies can represent an obstacle as much as an opportunity for a country's energy transition.[45,46] Pushing NOCs to take a central role in renewables might deter project financing, as more climate-focused investors may avoid associations with NOCs due to divestment strategies and reputational concerns. However, in some cases, these investments by NOCs can also accelerate the energy transition and provide NOCs with a stake in this shift, reducing resistance to change.

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Acknowledgments

The authors thank the people they interviewed as part of the research for this briefing, particularly Dr Asker Voldsgaard of the Danish Council on Climate Change. The authors also thank Amir Shafaie and Alex Malmqvist of NRGI and other colleagues in NRGI's fundraising, finance and human resource teams.

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