

Designing an effective offshore wind market:

Why bold targets and clear development plans are key



About this policy briefing

This is the second in a series of policy briefings by the Carbon Trust, which aims to help policymakers design effective offshore wind markets. For many countries, offshore wind will be the key to unlocking energy security and a cost-effective Net Zero transition. The first policy briefing introduced market scale and visibility as one of six fundamental policy pillars required for a whole-systems approach to offshore wind development. Facilitating market scale and visibility means making market opportunities visible to industry players, and creating a steady pipeline of offshore wind projects so that developers can achieve economies of scale. In this second policy briefing, we look at market scale and visibility in more detail, as we analyse the impact of specific measures and draw out lessons for maturing and emerging offshore wind markets.

This is a collaborative policy briefing, written by the Carbon Trust's [offshore wind](#) experts with input from the [Net Zero Intelligence Unit](#). It draws on the Carbon Trust's experience in providing offshore wind market insights and strategic advice across the UK, the US, Vietnam, Taiwan, the Netherlands, and other countries. Additional thanks to Helen Andrews-Tipper, Stefania Omassoli and Kieran Hymers.

Who we are

The Carbon Trust is a global climate consultancy driven by the mission to accelerate the move to a decarbonised future. We have a global network of more than 400 experts across the UK, the Netherlands, South Africa, China, Singapore and Mexico. As climate pioneers for more than 20 years, we work at the forefront of the global offshore wind industry, collaborating with governments, developers and innovators to make fixed and floating offshore wind a viable commercial energy generation solution.

The Net Zero Intelligence Unit provides experienced insights to accelerate global progress towards Net Zero. The Unit is a dedicated team focussed on raising ambition, awareness and action on Net Zero by drawing on the Carbon Trust's 20 years' experience of working with businesses, governments and financial institutions globally.

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Executive summary

Well-defined targets and other signs of long-term commitment from governments send a powerful signal to industries and investors.

Visibility of the long-term opportunities from entering a market allows industry players to invest and develop at scale. Facilitating this market scale and visibility is crucial for the successful growth and integration of any emerging technology. This is especially true for offshore wind (OSW) development, which comes with high Capital Expenditures and long lead times of over ten years from initial site planning to a fully commissioned wind farm. Government commitment during the early stages of market development is paramount. The visibility, consistency and robustness of government-issued objectives not only instil confidence and certainty among developers, but also act as catalysts for strategic investments.

Governments can demonstrate market ambition and political will through clear scenario planning and target setting. Well-defined targets for renewables technologies send a powerful signal to the industry and investors, indicating the government's commitment to creating a conducive environment for OSW development. These targets can encompass a variety of factors, such as installed capacity, renewable energy generation mix, or energy cost reduction, depending on the specific objectives of each market or region.

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Beyond targets, other signals of long-term commitment are also key to facilitating market scale and visibility. For instance, investors will require a clear route to market for any energy export, whether this is via a Purchase Power Agreement (PPA), direct government subsidy or other revenue mechanisms. Governments should ensure that any agreements will be honoured for the full duration agreed upfront, often for the duration of a wind farm's lifetime (generally 15-25 years). This is a key factor to minimise risks while the structure of revenue support will impact the overall bankability of a project.

The value of target setting has often been called into question, given that few countries are currently on track to meet their targets.¹ However, the Carbon Trust's analysis of offshore wind development across six key markets clearly demonstrates the positive impact of targets for facilitating market scale and visibility, and in turn, driving installations. Across both developed and emerging OSW markets, the value of targets and the importance of following them up with action plans is clear. Our comparison of government targets and actual deployment rates in the UK, the US, the Netherlands, Taiwan, Vietnam and France, highlights four key takeaways for target-setters.

¹ [80 Pct of Countries with Offshore Wind Targets to Miss Their Goals, RCG Says | Offshore Wind](#)



Our analysis and experience have revealed four key lessons for delivering market scale and visibility.

1. Targets spur on installations, and ambitious targets are strongly linked to higher deployment rates.

2. Targets must be followed by plans that clearly define processes and responsibilities.

3. Ambitious targets without coherent action plans can lead to stagnation.

4. Collaborative initiatives can support market scale and accelerate build-out.

After setting targets and developing clear regulatory frameworks, the UK and Netherlands saw positive growth in offshore installations. In France, a lack of coherent action plans led to stagnation for several years.

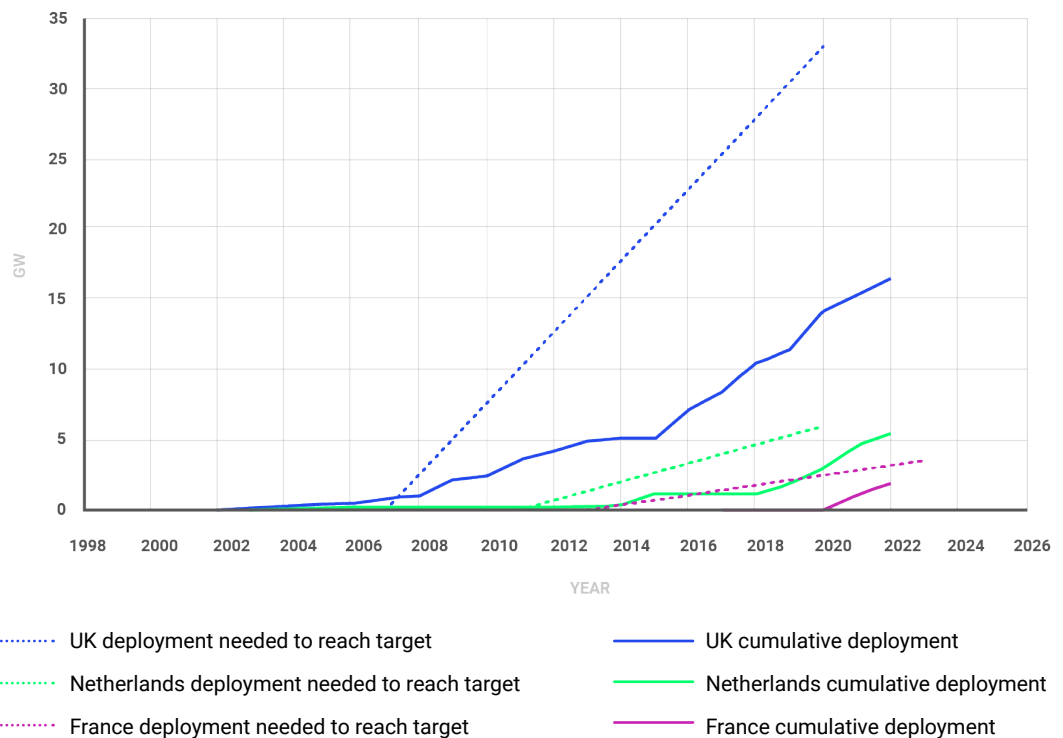


Figure 1. Graph of OSW projected targets set by governments versus actual installations in the UK, Netherlands and France as of 2022.^{2 3}

² [Global Wind Report 2023 - Global Wind Energy Council \(gwec.net\)](#)
[Government's offshore wind power target branded 'pie in the sky' | Wind power | The Guardian](#)
[Letter to Parliament Offshore Wind Energy Roadmap 2030 | Parliamentary document | Government.nl](#)
[The Offshore Wind Energy Sector_Taiwan_2014.pdf \(flandersinvestmentandtrade.com\)](#)
[France vows to learn from offshore wind experience as historic floating auction looms | Recharge \(rechargenews.com\)](#)
[Global Offshore Wind Farms Database | 4C Offshore](#)

³ 'Deployment needed to reach target' curve refers to the year the government first set the target, and the projected installations by the targeted year. For instance, The UK government first set a target in 2007 to achieve 33 GW OSW installations by 2020. 'Cumulative deployment' refers to actual annual installations, up to 2022.

1. Targets spur on installations, and ambitious targets are strongly linked to higher deployment rates

Target setting is an effective catalyst for offshore wind development as it attracts the attention of international developers. Although OSW growth is rarely ever linear, we observe that governmental target setting and clear policy support positively influences actual deployment, as Figure 1 demonstrates. In the six markets we studied, actual installations in the Netherlands most closely mirror the target. The Netherlands set a pragmatic target in 2013, aiming for 3.5 GW OSW capacity by 2023. This strategy was highly effective, as the OSW installations reached 2.8 GW by 2022 (80% of the set target), positioning the Netherlands as a mature OSW market in Europe.

However, countries that set bolder targets saw a much greater uptick in the pace of deployment. The United Kingdom is a prime example, where in 2007 the government set an ambitious OSW target of 33 GW by 2020.⁴ Actual installations reached 13.9 GW by 2022, the highest installed capacity of any country after China. Although further away from meeting its target compared to the Netherlands, the UK had an overall higher rate of deployment, due in large part to its higher level of ambition. This highlights the importance of ambitious targets, even when they are not fully realised.



The UK set an ambitious target of 33 GW by 2020, and by 2022 had the 2nd highest installed capacity in the world.

Setting well-defined targets has proved equally effective for emerging markets. In Taiwan, the observable installation trends closely parallel government targets. The government laid out its vision in 2014 by setting a target of 3 GW by 2025, encompassing both onshore and OSW capacity.⁵ As of 2022, Taiwan has already accomplished an installed OSW capacity of 1.4 GW, firmly establishing its position as a promising emerging market. It has done this by leveraging industry progress to develop OSW in the Asia-Pacific landscape.

2. Targets must be accompanied by clearly defined development models

Our experience shows that target setting alone is not enough. To drive deployment, governments must back up their aspirations with well-defined approaches, outlining how they intend to achieve them. There are two main models for offshore wind development – centralised⁶ and decentralised⁷ – which place different levels of responsibility on developers and governments. However, the type of development model is not the most important factor when creating an offshore wind market. Typically, both models can be effective and tailored to the specific needs of the individual market. Clarity around processes and responsibilities is far more important to developers and investors.



Clarity around processes and responsibilities is of paramount importance to developers and investors

However, this clarity needs to be present for all stakeholders, whether public or private, at an early stage. The Netherlands, for example, has taken a centralised approach to its market development, as its government absorbs significant risks, minimising risks for developers.

³ [Letter to Parliament Offshore Wind Energy Roadmap 2030 | Parliamentary document | Government.nl](#)

⁴ [Government's offshore wind power target branded 'pie in the sky' | Wind power | The Guardian](#)

⁵ [The Offshore Wind Energy Sector, Taiwan, 2014.pdf \(flandersinvestmentandtrade.com\)](#)

⁶ In centralised development models, governments take on more up-front risk by managing many of the pre-development stages and parcelling out specific sites of seabed for auction.

⁷ In the decentralised model, the private sector (developers) shoulder more risk but also have more control in these early stages.

This includes the government taking responsibility for providing initial site survey data, managing grid infrastructure and integration, and reducing pre-bid investment risks, financing, and societal costs. In 2013, the Dutch government published its 'Energy Agreement for Sustainable Growth'⁸ and 'Offshore Wind Energy Roadmap for 2030'. This not only signalled a strong commitment to build 11 GW of OSW by 2023, but also outlined a clear strategy for achieving the target. This facilitated a comprehensive, system-wide approach to OSW development and led the Netherlands to successfully install 2.8 GW of OSW capacity in a decade.

The UK, on the other hand, has adopted a decentralised approach. This means assigning responsibility for site development to developers. The nascent nature of fixed-bottom OSW in the late 1990s and early 2000s made investments for developers much riskier than they are now. The UK government therefore needed to signal a long-term commitment towards prioritising technology demonstration and Research and Development (R&D) to foster industry confidence and secure investment. They did so by introducing the Non-Fossil Fuel Obligations (NFFOs) and later Renewables Obligations (ROs) support schemes. These demonstrated political will and ambition in a consistent policy framework even before the first OSW target was announced in 2007.⁹ The ROs were adapted over time, and, eventually replaced by the Contract for Differences (CfD) scheme in 2014 which helped to drive innovation and in turn facilitate cost reduction. **Although the UK and the Netherlands took different approaches to developing offshore wind, both became market leaders by providing consistent policy support and making processes clear to industry.**

Case study: How facilitating market scale and visibility helped the UK become a global leader in offshore wind.

To underline its long-term commitment, the UK government set a target in 2007 to reach 33 GW of installed OSW capacity by 2020. Then, in 2014, the government announced the allocation of annual budgets to the Contracts for Difference (CfD) scheme as an incentive mechanism and charted a policy direction for OSW to reach 10% of the UK's electricity demand by 2020. The contracts are regulated and enforced by the government-owned company LCCC (Low Carbon Contracts Company) and guarantee renewable energy asset owners a fixed price (£/MWh) for the electricity generated during the 15-year contract (roughly the full lifetime of a wind farm). By strengthening and clarifying the UK's commitment, target setting and the CfD scheme combined have significantly supported the UK in solidifying its position as the world's second-largest OSW market in terms of installed capacity with almost 14 GW by 2022.

3. Ambitious targets without coherent action plans can lead to stagnation

Ambitious and well-defined targets have proven instrumental in driving development of OSW in many markets. However, the same cannot be said for France. Despite setting targets, the French government encountered challenges in translating their aspirations into concrete progress. This was down to the absence of a coherent action plan. In particular, the government lacked a clear development model, and the consequences of this deficiency were evident – delays materialised, and targets remained elusive. At the heart of the issue, the processes for obtaining permits to build and operate wind farms were tangled in a complex web of regulatory layers.¹⁰ This convoluted landscape created long lead times for necessary approvals as well as uncertainty for investors and developers. These uncertainties, in turn, stalled growth within the French OSW market.

⁸ [Energy Agreement for Sustainable Growth | Publication | Government.nl](#)

⁹ [Government's offshore wind power target branded 'pie in the sky' | Wind power | The Guardian](#)

The lesson is stark: ambitious targets alone, without a streamlined development blueprint, can lead to stagnation rather than success. France has only 482 MW of installed OSW capacity as of 2022, which puts it significantly behind emerging markets like Taiwan and Vietnam. In 2020, the French government set an official OSW target of 5.2-6.2 GW for 2030 as part of the Multi-Year Energy Programme (PPE), in which they envisioned 2.4 GW to be installed by 2023. The government has also indicated its ambition to make OSW a core part of energy transition plans and to support the development of new OSW projects through various initiatives. These include competitive auctions for project contracts and financial incentives for developers.¹¹



The lack of a clear development model created uncertainties which stalled growth within the French offshore wind market.

These are positive signals of the French government's ambition and political will to drive their OSW development. To continue its growth journey, it will be important to tailor development models to the French context and draw lessons learnt from previous experience and other markets.

4. Collaborative initiatives can support market scale and accelerate build-out

As an emerging market, the US set a target in 2021 to install 30 GW of fixed-bottom OSW by 2030 and 15 GW of floating OSW by 2035. These ambitious targets were followed by a high level of interest from international developers. Much like the UK's trajectory, these targets are expected to accelerate the rate of OSW deployment in the US and entail similarly steep annual installation rates. However, the US has a unique contextual factor which needs to be considered: political state-level power. States have their own policies and targets. They are also motivated by their own policy goals around climate change mitigation, job creation, and industry development. While a certain level of competition can be positive, some cross-state collaboration can also be helpful to optimise supply chain investment and accelerate OSW build-out. This applies to the development of nascent floating wind technology as much as traditional fixed-bottom technology. In the UK, the Carbon Trust's Offshore Wind Accelerator facilitates collaboration between developers who otherwise compete on the market; it has supported market scale and build out through knowledge sharing, cost reduction and triggering industry standards which have enabled larger turbines.



Political state-level power is a unique factor in the US; some competition can be positive, but some cross-state collaboration can be helpful.

The US government has already taken positive steps in this direction. In 2022, it launched the Federal-State Offshore Wind Implementation Partnership.¹² The Partnership is supported by governors of 11 East Coast states and aims to expand to the West Coast and Gulf of Mexico as these regions gain traction in developing OSW in their waters. The Partnership seeks to endorse both federal and state commitments to expand the US supply chain, fund increased vessel supply to accelerate OSW build-out and address ocean co-use as well as transmission needs. They aim to achieve this through collaborative initiatives such as developing a shared procurement and leasing timeline for East Coast states and creating a National Offshore Wind Supply Chain Roadmap.¹³ Further collaboration of this kind will help to realise the federal targets and ensure momentum is not lost.

¹⁰ [France's ambitious offshore strategy faces obstacles – EURACTIV.com](#)

¹¹ [Exploring the Potential of Offshore Wind Energy in France | REVE News of the wind sector in Spain and in the world \(ewind.es\)](#)

¹² [FACT SHEET: Biden Administration Launches New Federal-State Offshore Wind Partnership to Grow American-Made Clean Energy | The White House](#)

¹³ [FACT SHEET: Biden Administration Launches New Federal-State Offshore Wind Partnership to Grow American-Made Clean Energy | The White House](#)

Conclusion

Our analysis of six maturing and emerging OSW markets illustrates that actual installations often mirror the targets set by governments.

It is evident that target setting plays a pivotal role in creating market visibility and driving installations, contributing to the successful growth of OSW markets. This lesson should be adopted by emerging markets, particularly the US and markets in the Asian-Pacific region, where newer floating OSW technology is expected to dominate due to deep waters.¹⁴

According to the Carbon Trust's research, the Asian market is predicted to dictate the market share of floating OSW in the coming decades and is expected to overtake Europe with the largest market share shortly after 2030. Target setting will be the first useful strategy to deploy to create a market for floating technology, just as it helped to commercialise fixed-bottom OSW technology in Europe.

However, it is crucial to recognise that target setting is not the sole determinant of a robust market. Emerging markets should combine ambitious targets with clear and fit-for-purpose development models to navigate challenges and create thriving OSW industries. Drawing lessons from the UK, France, the Netherlands and others, emerging OSW markets should prioritise transparency, outline regulatory processes, and define the responsibilities of both public and private stakeholders to accelerate their OSW industries.

This policy briefing is the second in a series aiming to help policymakers design effective offshore wind markets. All policy briefings within the series, as well as further information on our strategic advisory work on offshore wind, are available on the Carbon Trust website.

¹⁴ [The Carbon Trust – Floating JIP Summary Phase IV](#)

