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永續發展脈絡下的能源轉型、權利衝突與公共信託
—比較臺灣與英國之離岸風電發展

Energy Transitions, Conflict of Rights and Public Trust in
Sustainable Development

—Comparing Offshore Wind Power Developments in the UK and Taiwan

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之離岸風電發展

Energy Transitions, Conflict of Rights and Public Trust in Sustainable Development—
Comparing Offshore Wind Power Developments in the UK and Taiwan

本論文係 方彥之 (R09247002) 在國立臺灣大學氣候變遷與永續發展國際學位學程完成之碩士學位論文，於民國 111 年 9 月 8 日承下列考試委員審查通過及口試及格，特此證明。

The undersigned, appointed by the International Degree Program in Climate Change and Sustainable Development, College of Science, National Taiwan University, on 8th September 2022, have examined a Master's thesis entitled above presented by Max Fang (Student ID: R09247002) candidate and hereby certify that it is worthy of acceptance.

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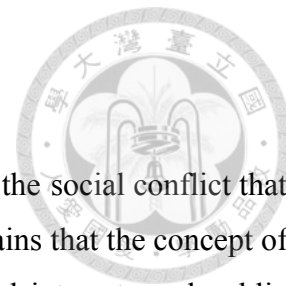
摘要



本文致力於研究基於永續原則的發展活動是如何導致社會衝突以致於拖累邁向永續社會的努力。本文主張公共信託理論的精神需要被具體實踐以消弭其在國家層次與地方層次上公共利益的巨大落差。本研究比較並分析臺灣與英國在離岸風力發電發展上的案例，基於離岸風電發展具有基於永續原則的發展活動的主要特徵：政府主導的開發計畫為了達成能源轉型上的政策目標；以永續發展為理由而進行在行政管制面上的政策變遷；以及互相衝突的公共利益與個人權益。本文將此研究分為四個主要層面進行討論：政策偏好與政治取向，整體量能，公共治理，以及權利衝突。經過研究，本文發現臺灣政府應扮演更加積極的角色，在離岸風場規劃過程中協調並降低衝突。本文建議臺灣應進行並落實在漁業資源管理的行政管制變革，並將公共信託理論作為永續原則的政策考量納入法律政策當中以拉近管制國家與實際社會之間的距離。基於以上，本研究的主要貢獻為提供一個可行的政策框架，以面對並解決長期存在的政治社會問題—各方利害關係人基於海洋公共資源的權利衝突，並進一步加速整體社會在永續發展架構下的能源轉型過程。

關鍵字: 離岸風力, 基於永續原則的發展活動, 漁業, 公共信託理論, 氣候變遷, 永續原則

Abstract



This is a thesis about how sustainable development activities give rise to the social conflict that may hinder the efforts on the path toward sustainability. The thesis maintains that the concept of public trust should be substantiated in response to the gap between local interests and public interests at national level. The research will conduct comparative analysis on cases in Taiwan and the United Kingdom and provide observations focusing on the topic of offshore wind development since it bears prominent characteristics of sustainable development activities: government-led development projects induced by policy goals on energy transitions, regulation-oriented policy changes in the name of sustainable development, and conflicting values between public and individual interests. After researching the topic of offshore wind development in Taiwan and the UK in four dimensions—policy preferences and political attitudes, national capacity, governance, and the conflict of right, the thesis found that the Taiwanese government should play a more active role in coordinating and reconciling the conflict during the leasing process. The thesis holds that an overhaul to the current Taiwanese regulatory regime on fish resource management needs to be taken into action, and suggests that the public trust as a consideration to sustainability is a missing piece in the legal policy and that it would help bridge the gap between the regulatory state and society. The primary contribution of the thesis is to provide a viable policy framework in order to resolve the long existing socio-political conundrum due to the conflict of rights and interests among stakeholders over natural resources at sea, and thus catalyze energy transitions within the context of sustainable development.

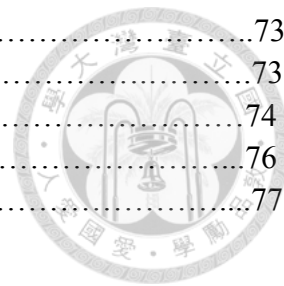
Keywords: offshore wind energy, sustainable development activities, fisheries, public trust, climate change, sustainability

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Chapter 1: Introduction



Sustainable development is a fundamental principle regarding the developmental philosophy of human society. After the publication of *Our Common Future*¹ in October 1987, countries and societies have been searching for decades for a path of human development under the principle of sustainability. At the Earth Summit in June 1992², nations embarked on Agenda 21³ and made the Rio Declaration on Environment and Development⁴. Since then sustainable development has been a frenzy in international society. Along with the emergence of global governance, the ratification of the Kyoto Protocol⁵ embodied an international effort in pursuit of a global regulatory regime in controlling greenhouse gas (GHG) emissions. As treaties started to regulate substantive matters and member states began the internalization of international treaties,

¹ World Commission on Environment and Development. (1987). *Our Common Future*. Oxford, England: Oxford University Press.

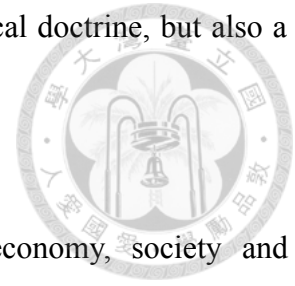
² Officially the United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit or the Rio Summit, a United Nations conference held in Rio de Janeiro from June 3 to June 14, 1992.

³ Agenda 21 is a non-binding agenda adopted in the Earth Summit, standing as an action plan of the United Nations in regard to sustainable development.

⁴ The Rio Declaration on Environment and Development is an international diplomatic document that proclaims 27 principles in sustainable development; it was signed over at the Earth Summit by most of the nations in the world.

⁵ Kyoto Protocol, formally the Kyoto Protocol to the United Nations Framework Convention on Climate Change, signed on 11 December 1997 and into effect on 16 February 2005, is an international treaty that intended to regulate and reduce global greenhouse gas emissions in order to mitigate the effect of global warming. It invented the renowned Clean Development Mechanism (CDM) for carbon offset and promoted a market-based regulatory system with Certified Emission Reduction (CER) units.

sustainable development was not merely a political slogan or philosophical doctrine, but also a substantiated concept of public policy and principle of law.



The modern concept of sustainability is built upon three pillars: economy, society and environment. (Purvis *et al.*, 2019, p. 682). The notion of sustainable development is conceptualized with an arresting duality in its nature. While the term does not have a universal definition, it *per se* expresses the concept that certain development is of a sustainable nature; that is to say, development itself is a presumption, rather than a premise, in the discourse, for it suggests an endorsement of the “business as usual” idea. (Stallworthy, 2002, p. 2).

From a heuristic point of view, sustainable development is a “notoriously difficult, slippery and elusive concept” to pin down with a range of diverse and contested meanings. A starting point suggested by scholars to understand the concept in literature is a shared idea called “environmental paradox”, which signifies “a mismatch between what is demanded of the Earth and what the Earth is capable of supplying”. Two approaches attempted to provide solutions to the gap: “weak sustainability (or shallow environmentalism)”, and “strong sustainability (or deep sustainability)”. (Williams & Millington, 2004, pp. 99-100). However, no matter which approach one takes, it is not difficult to find that both of them recognize that sustainable development is to curb the observed human development that does not consider natural sustainability. In order to prevent the self-destruction of human beings and/or simply to conserve the natural environment, development activities need to be restricted to the extent in which sustainability is properly satisfied.

In this sense, transnational constitutionalism in international environmental law represents the integration and internalization of international norms into domestic legal policies, and also vice versa⁶. As nations undergo their policy learning of environmental governance at international level, policy formulations at domestic level come up to synthesize their values and engender outcomes and feedback back to the international community. The triple-loop learning theory explains their relationships and interactions by identifying processes of the regime evolution; arguing that climate-related governance is complex, uncertain and nonlinear; and holding that participatory processes and trust are keys to success. (Gupta, 2016, pp. 192-193). The failure of the extension of the Kyoto Protocol⁷ and the ratification of the Paris Agreement⁸, signaled a transition of paradigms (Kuhn, 1962) might occur from a top-down, state-led international governance to a more inclusive and participatory governance model that contains actions from non-state and sub-state actors, and voluntary-based contributions.

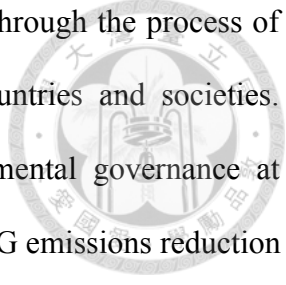
Sustainable development then became a doctrinal principle in global environmental governance as the United Nations adopted the Sustainable Development Goals (SDGs)⁹ in 2015 as part of

⁶ Especially from a constitutional perspective, *see* 張文貞 (2012), p. 49.

⁷ The Protocol has two commitment periods. The first started from 1997 to 2008, in which all members that fully participated complied with the Protocol; the second was set in 2012 as the Doha Amendment to the Kyoto Protocol to extend the Protocol through 2020. However, only Australia, the European Union and a couple of other European countries accepted the second round targets.

⁸ Paris Agreement, also called the Paris Accords, is an international treaty under the United Nations Framework Convention on Climate Change. It was signed on 22 April 2016 and went effective on 4 November 2016 with over 190 participating states. It devised the voluntary-based system of nationally determined contributions (NDCs) with pledge and review (also known as the ratchet mechanism), and emphasizes inclusiveness and voluntary participation. According to its Article 2, the ultimate goal of the treaty is to curb global warming below 2°C (equivalent to 3.7°F).

⁹ The 17 SDGs are: (1) No Poverty, (2) Zero Hunger, (3) Good Health and Well-being, (4) Quality Education, (5) Gender Equality, (6) Clean Water and Sanitation, (7) Affordable and Clean Energy, (8) Decent Work and Economic Growth, (9) Industry, Innovation and Infrastructure, (10) Reduced Inequality, (11) Sustainable Cities and Communities, (12) Responsible Consumption and Production, (13) Climate Action, (14) Life Below Water, (15) Life On Land, (16) Peace, Justice, and Strong Institutions, (17) Partnerships for the Goals. They are developed in order to succeed the Millennium Development Goals that ended in 2015.



their Agenda 2030¹⁰, and became a policy doctrine in domestic politics through the process of policy learning from decision-making to policy implementation in countries and societies. Taking a large portion of the discussion in sustainability and environmental governance at domestic level, energy transitions as a means to reach national goals of GHG emissions reduction in climate mitigation appear in many forms contingent upon their own specific occasions and conditions; nevertheless, all of them involve the changing usage of natural resources. Transitioning from fossil fuels to renewable energy is accompanied with energy development and dispositions that are inevitably associated with changes in land use, marine spatial planning, and regulatory policies concerning re-allocations of public interests. In countries whose governments—instead of the markets, are taking the lead in energy transitions, drastic policy transformations could be observed in their political and energy landscape. On the bright side, new industries and job opportunities are created; cutting-edge technologies are invented and implemented; renewal of public infrastructures accompanies; and external benefits, such as better air quality and less pollution, are generated. In the name of sustainable development, it sounds like a fairy tale.

However, in the shadows, their social costs are usually neglected. Energy transitioning means new energy developmental plans that often result in interruption or departure of local people, families, and communities. As what has been pointed out in the Glasgow Climate Pact¹¹, a just transition¹² for those who would be affected by the measures and policies in order to mitigate

¹⁰ Agenda 2030, or the 2030 Agenda, is a United Nations General Assembly resolution that includes the SDGs developed from the Post-2015 Development Agenda.

¹¹ The Glasgow Climate Pact is an international agreement reached at the 2021 United Nations Climate Change Conference (COP26) held in Glasgow, United Kingdom from 31 October 2021 to 13 November 2021.

¹² According to Article 32 of the Glasgow Climate Pact.

climate change and environmental effects needs to be assumed as sustainable development becomes a substantive public policy in the form of energy transitions. Climate justice¹³ shall include not only those who are affected by climate change and affiliated natural disasters, but also those who should be identified as climate minorities due to public efforts and activities on mitigation and climate adaptation, since they suffer from those majoritarian-supported policy changes in the name of sustainable development that trigger re-allocations of utilities/usufructs of natural resources—those they mainly rely on for their livelihoods.

In general, policy change constitutes inconsistency in regulations. However, traditional explanations of regulatory law often suggested that the state—namely, government agencies, holds the administrative authority toward subject matters. Agencies assured authoritative power within their own capacity can enunciate policies deliberatively. The courts of common law make changes of legal policy as they distinguish earlier cases in their decision-making process; the administration should be allowed with similar leeway. (Breyer *et al.*, 2002, pp. 529-530). Its authority may also trigger any policy change concerning any regulation at their discretion, including those involving the extinguishment of what has been called “licensed property”. (Raymond, 2003, pp. 14-15). Indeed, some may suggest that the obligation of notification and other kinds are enough for a due process necessary to justify a policy change, even if that brings about annulment or dilution of interests created by prior policies based on economic approaches. (Jacobs, 1995; Moran, 1995; and Anderson & Leal, 2001). Nonetheless, although disclaimed as a property *de jure*, as what Pappas (2018) has pointed out, they should not be compromised from

¹³ Preamble of the Glasgow Climate Pact, “... also noting the importance for some of the concept of ‘climate justice’, when taking action to address climate change, ...”

the Fifth Amendment¹⁴ principles. (Pappas, 2018, p. 441). The fulfillment of the due process requirement can be considered a protection against arbitrary and unfounded government action; additionally, although the Fifth Amendment protection was created in terms of expropriation of property and compensation, it is not merely a protection of value in and of itself. (Pappas, 2018, p. 413). Therefore, the thesis intends to explore more in subsequent chapters about the spirit of the due process as a gatekeeper to a just and fair energy transitioning policy-making.

In addition, those interests, from a human right point of view, may be substantively critical to one's privacy, family, cultural dignity, and community affiliation. The Declaration on the Right to Development¹⁵ first defined in its Preamble that development is “a comprehensive economic, social, cultural and political process”¹⁶ and proclaimed the rights conferred upon human development as a fundamental one; the International Covenant on Economic, Social and Cultural Rights¹⁷ recognized that each individual “is entitled to participate in, contribute to, and enjoy economic, social, cultural and political development”¹⁸; the Rio Declaration on Environment and

¹⁴ Amendment V to the United States Constitution, “No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a grand jury, except in cases arising in the land or naval forces, or in the militia, when in actual service in time of war or public danger; nor shall any person be subject for the same offense to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.”

¹⁵ The United Nations General Assembly adopted the Declaration on the Right to Development in 1986. Particularly in Article 3 is suggested that states are bearers of the responsibility to assure the right to development.

¹⁶ Preamble of the Declaration on the Right to Development, “... Recognizing that development is a comprehensive economic, social, cultural and political process, which aims at the constant improvement of the well-being of the entire population and of all individuals on the basis of their active, free and meaningful participation in development and in the fair distribution of benefits resulting therefrom, ...”

¹⁷ The International Covenant on Economic, Social and Cultural Rights (ICESCR) is one of few international treaties called “covenant”; it was adopted by the United Nations General Assembly on 16 December 1966 and went effective on 3 January 1976.

¹⁸ Section 1 of the Article 1 of the ICESCR, “The right to development is an inalienable human right by virtue of which every human person and all peoples are entitled to participate in, contribute to, and enjoy

Development stated in the Principle 3 that “the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations”¹⁹. Those interests whose status are defined in property law do not concern themselves with their importance in human rights; the property disclaimers should not exempt the state from its responsibility in human rights protection, procedurally and substantively. (Pappas, 2018, pp. 396-397).

Some may argue that a policy change in the name of sustainable development often arises with strong moral foundations of public interests. It might be true. However, the trade-off among conflicting social interests and values contributes to a conundrum—or even a political deadlock in the conflict of rights in sustainable development between different stakeholders at different levels and scales. It is, in fact, difficult to measure and substantiate the public interests involved in a quantitative manner with the high uncertainty of climate change in its causal relationships and risks assessment to a substantive regard. (Leary & Esteban, 2009). The policy (change) would be forced to be undertaken with decision making in uncertainties. (葉俊榮, 1997a, pp. 140-142). Moreover, modern environmental regulations are in principle designed to prevent harm in the face of uncertainty; it is about the issue of acceptability, in which risk management is the backbone concept in balancing interests to determine how much of the harm-causing potential is ought to be eliminated. (Percival *et al.*, 2009, pp. 181-182). The society must negotiate the conflict between the values served by preventing harm and the values served by the harmful activity. (Percival *et al.*, 2009, p. 239). Yet, in the topic of this research, the activity *per*

economic, social, cultural and political development, in which all human rights and fundamental freedoms can be fully realized.”

¹⁹ This brings in the concept of intergenerational equity under international spotlights, and also embodies the principle of sustainability. *see* Batt & Short (1993); Popovic (1993); Wirth (1995); and Viñuales (Eds.) (2015).

se that suffers regulatory expropriation is not even a harmful cause to the policy change in the name of sustainable development. As a result, procedural rationality and due process need to be emphasized more in the process of decision-making. (葉俊榮, 1997a, p. 3).



Among all kinds of renewable energy, offshore wind energy is one of the most promising superstars and leading industries in the world of energy transitions, and the market is burgeoning. Taking the United States for example, President Biden on March 29, 2021 announced that the United States will embrace renewable energy and boost its capacity in offshore wind. The administration has set out a policy target to deploy 30 GW²⁰ by 2030. The power generation is going to satisfy the demand of more than 10 million households in the U.S. for a year and reduce 78 million metric tons of carbon dioxide (CO₂) emissions. It is expected that the total sum of capital investment per year will reach 12 billion dollars or above with at least 44 thousand employment positions in the industry plus 33 thousand additional jobs opportunities created in communities connected to offshore wind activities through 2030²¹.

For a long time, the U.S. wind industry has been concentrated on onshore wind. From the late 1990s, many discussions started to notice the potential of offshore wind as an undiscovered blue ocean. The Block Island Wind Farm (BIWF) is the first offshore wind farm into commercial operation in the United States. It is so far the largest wind energy project in the state of Rhode Island with the capacity of 30 MW²², located 3.8 miles (3.3 nautical miles; 6.1 kilometers) away

²⁰ GW is the abbreviation of gigawatt, which is a unit of power equal to one billion watts.

²¹ The White House. (29 March 2021). FACT SHEET: Biden Administration Jumpstarts Offshore Wind Energy Projects to Create Jobs.

<https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administratio-n-jumpstarts-offshore-wind-energy-projects-to-create-jobs/>

²² MW is the abbreviation of megawatt, which is a unit of power equal to one million watts.

from the coast of Block Island, Rhode Island in the Atlantic Ocean. The construction was completed in 2016²³. This wind farm is one of the most successful business projects in the field. Other than the Block Island case, there were countless offshore wind energy development projects that have been proposed in the last two decades. However, few of them succeeded. One of the major reasons is that they all encountered severe opposition from the local communities.

The issue also happens in other major and rising offshore wind markets: Taiwan, a stark example that would be addressed in this thesis. In Taiwan, one of the most important and striking issues spotted by the research is the conflict between offshore wind development and the interests of the fisheries. In Taiwan, offshore wind power has particularly been stressed by the government as their focus in the sustainable energy investment plan. The government plans to raise the offshore wind power capacity to 5.7 GW by 2025. Moreover, it is believed that in the large swath within the Taiwan Strait alongside the western coast of Taiwan lie at least 16 places of the best potential wind farms around the world.

Additionally, the government of Taiwan has made great effort in mitigating potential impact on local communities and industries as it also promised industrial transformation. It launched the Office of Energy and Carbon Reduction under the competence of Executive Yuan (Taiwanese Mandarin: 行政院, which is the executive branch of the Government of Taiwan). The office played as a liaison among different departments at the central government level and communicated government policies to the general public. It also fostered the government's national strategies, and promoted government projects provided with incentives for industrial

²³ Deepwater Wind. (n.d.). America's first offshore wind farm powers up. <https://dwwind.com/press/americas-first-offshore-wind-farm-powers/>

development in the wind energy industry. It also consulted with local governments about the national policies and industrial strategies.



However, this national-level energy strategy has been facing challenges resulting from oppositions from local fishing operators and communities. When the government is to seize the fishing right, it should provide just compensation in return as mandated. In the current Taiwanese legal policy; still, what constitutes just compensation is defined merely by a formula made by the government. The issue of offshore wind power development became a social and highly politicized problem in Taiwan, and the local communities' protests against the development projects have caused a lose-lose situation between stakeholders. A number of causes precipitated the intense opposition from the local communities; yet among which the “expropriation” system stood for the most outstanding one out of their main concerns. It is an institutional problem in the current law system.

In order to deepen the understanding of the legal system, the thesis will introduce the theory of public trust in explaining the ideological basis of Taiwanese fisheries regulations and try to identify crucial institutional issues that need to be resolved. Next, the thesis will compare the situation of Taiwan with that of the United Kingdom, since Taiwanese offshore wind development policies mirror those of the United Kingdom especially exemplified by Taiwanese government's plans on their three-stage developmental strategy. (張睿寧, 2021, p. 9). Lastly, the thesis will provide policy recommendations for those issues.

Chapter 2: Offshore Wind in Taiwan



In Taiwan, energy development in the wind and solar departments has been gradually taking priority in the political agenda; offshore wind power has particularly been highlighted by the government of Taiwan. Starting from the mid 2010s, the government has pledged to invest more in sustainable energy development as policy goals of transforming the energy supply and creating a nuclear-free homeland were set for the next decade. This small island's tremendous potential to become the second largest market of offshore wind energy in East Asia attracted a huge amount of global investors and companies, including but not limited to Senvion (the largest off-shore wind turbine manufacturers in the world), MHI Vestas, Siemens Gamesa, and Ørsted (an emerging giant in the wind energy industry). In addition, Taiwanese government has made great efforts in promoting cooperation between foreign and local investors with subsidiaries and feed-in tariff policies, as well as the reconciliation of potential impacts on local shipping and fishery industries.

However, despite all these advantages, the development plan was criticized as too ambitious upon the fact that the expected span of time for construction is far shorter than what is actually in need with the feedback of other countries' experiences. In order to satisfy the expectation, there would be nearly 600 wind turbines that need to be installed and put into operation in the 7 years;

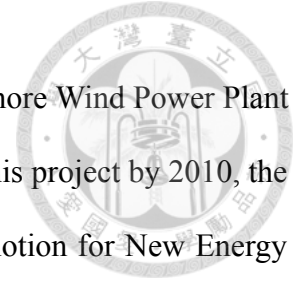
the required speed is almost twice more rapid than the average of the cases observed in many Western European countries over the past two decades. In fact, the implementation has encountered difficulties, including but not limited to the opposition from local communities resulting from the conflict of interests between the fishing operators and renewable energy developers. has become a conundrum. Furthermore, in spite of its efforts in engagement and communications, severe confrontations have never been pacified among the central and local governments, investors, local contracting manufacturers, operating developers, even non-governmental organizations (NGOs), and most significantly, the local communities.

A Policy Preferences and Political Attitudes

Taiwan started its wind energy development in the early 2000s. In November 2000, the first experimental wind farm was completed at Yunlin County (Taiwanese Mandarin: 雲林縣) followed by countless development projects initiated by Taiwan Power Company and other developers. (林明照, 2006, p, 323). Since then, the government has been devoted to wind energy development. However, early development primarily leaned on the onshore wind sector and offshore wind in Taiwan fell far behind the starting line. Additionally, few market-based regulatory tools or policy incentives for wind energy development were provided by the government at the time although the Taiwan Ministry of Economic Affairs (MOFA) Energy Commission²⁴ promulgated in 2000 the Regulations Governing Subsidies Toward Wind Power Generation System Installation²⁵. (施信民, 2002, p. 5-1).

²⁴ The Energy Commission (Taiwanese Mandarin: 能源委員會) was an entity under the Taiwan Ministry of Economic Affairs. It was reformed and became the Bureau of Energy (Taiwanese Mandarin: 能源局) since 2004.

²⁵ Translated by the author from its original title in Taiwanese Mandarin: 風力發電示範系統設置補助辦法, the Regulations was promulgated on March 22, 2000.



In 2007, the Ministry of Economic Affairs announced the First-stage Offshore Wind Power Plant Development Project²⁶; however, since none of the developer apply for this project by 2010, the project had been transferred to the Executive Yuan Commission on Promotion for New Energy Development²⁷ and implemented by the Bureau of Energy. (陳芙靜 & 李孟諺, 2010, p. 46). According to the government's research, waters in 5-20 meters depth along the west coast of Taiwan are endowed with potential offshore wind reserve of 1,200 MW in capacity that could be developed²⁸. (陳芙靜 & 李孟諺, 2010, p. 39).

In 2009, the Legislative Yuan of Taiwan²⁹ further passed the Renewable Energy Development Act³⁰. The Act authorized the government to provide a series of economic incentives for renewable energy development including feed-in tariffs (FITs) and subsidies. (范建得, 2009, p. 199). It instructed a three-stage development strategy, stemmed from which the government launched the Thousand Wind Turbines Project³¹. The project, however, prioritized onshore wind to offshore wind development³². It planned an increase of 1,200 MW onshore capacity by 2020

²⁶ Translated by the author from its original title in Taiwanese Mandarin: 第1階段設置離岸式風力發電廠方案.

²⁷ Translated by the author from its original name in Taiwanese Mandarin: 行政院新能源發展推動會.

²⁸ This excluded the areas that overlapped with those incompatible to be developed for reasons including the potential fault line in Hsinchu (Taiwanese Mandarin: 新竹), natural reserves in Taichung (Taiwanese Mandarin: 臺中) and frequent earthquakes in Tainan (Taiwanese Mandarin: 臺南); and was calculated under the conditions that the turbines are distanced in 4 times length of the rotor blade's diameter perpendicular to the wind direction and 10 times length of the rotor blade's diameter parallel to the wind direction, and that every wind turbine has 3 MW in capacity.

²⁹ The Legislative Yuan (Taiwanese Mandarin: 立法院) is the legislative branch of Taiwanese government. It is the unicameral legislature of Taiwan.

³⁰ The Renewable Energy Development Act (Taiwanese Mandarin: 再生能源發展條例) was passed on June 12, 2009 and came in effect on July 8, 2009.

³¹ The Thousand Wind Turbines Project (Taiwanese Mandarin: 千架海陸風力機) was a renewable energy project that was launched during the Ma administration.

³² The project's slogan was, "onshore wind first, offshore wind later (Taiwanese Mandarin: 先開發陸域風場, 續開發離岸風場)."


and initiated a construction project of demonstration offshore wind farm³³ with 520 MW capacity in order to prepare for the future development of an anticipated 3,000 MW offshore wind capacity by 2025. (交通部, 2017, p. 5). To encourage the investment, the Offshore Wind Power System Demonstration Incentive Regulations³⁴ was promulgated in 2012 by the Ministry of Economic Affairs. (饒瑞正, 2021, p. 63; 交通部, 2017, p. 5).

In 2017, the government announced the Four-year Wind Power Promotion Plan³⁵ as the first national energy development strategy that largely focused on offshore wind development and set off a substantive policy goal of raising the renewable sector up to 20 percent of the total power generation including an already planned 3 GW offshore wind capacity by 2025. (經濟部能源局, 2017, p. 1). The goal for wind energy capacity was raised later from 4.2 GW to 6.9 GW. (經濟部能源局, 2017, p. 1; 黃嘉偉, 2020, p. 4). The Ocean Affairs Council (Taiwanese Mandarin: 海洋委員會) was established in 2018 in order to integrate regulations that are concerned with Taiwan's marine affairs. However, Taiwan's offshore wind policies, from the demonstration projects in the early stage to the zonal development stage, are primarily instructed by the Ministry of Economic Affairs Bureau of Energy. (饒瑞正, 2021, pp. 2-3). They include but are not limited to policies and plans like the Thousand Wind Turbines Project and Four-year Wind Power Promotion Plan mentioned above.

³³ Translated by the author from its original name in Taiwanese Mandarin: 離岸示範風場.

³⁴ The Offshore Wind Power System Demonstration Incentive Regulations (Taiwanese Mandarin: 風力發電離岸系統示範獎勵辦法) was promulgated on July 3, 2012 (code: 經濟部經能字第 10104604190 號令) and revised with the name changed to the Offshore Wind Power Demonstration Incentive Regulations (Taiwanese Mandarin: 離岸風力發電示範獎勵辦法) on July 8, 2019 (code: 經濟部經能字第 10804602860 號令).

³⁵ The Four-year Wind Power Promotion Plan (Taiwanese Mandarin: 風力發電4年推動計畫) was a wind energy project launched during the Tsai administration.



One of the major objectives of Taiwanese offshore wind development policy is to achieve nuclear-free by 2025. (饒瑞正, 2021, p. 193). The Tsai administration³⁶ emphasized nuclear-free homeland policy and economic development when developing Taiwanese offshore wind energy under the administration's political slogan "nuclear-free homeland 2025"³⁷. (陳中舜, 2018, p. 119; 經濟部能源局, 2017, p. 1; 張睿寧, 2021, p. 1). By comparing Taiwan's 2019 energy source mix and its 2025 targets, it is obvious that the expected expansion of the renewable sector is to replace the vanishing part of the nuclear one while the coal and natural gas still compose nearly 80 percent of the total power generation. (Feigenbaum & Hou, 2020, p. 7). Additionally, according to the statistics published by the Bureau of Energy in 2022, Taiwanese wind energy did not grow in terms of portion, taking less than 2 percent with the renewables as a whole only taking approximately less than 7 percent of the whole power sector for the past two decades. In contrast, the fossil fuel part has stayed steadily over the 80 percent high bar for 15 years through 2021. (經濟部能源局, n.d.). Despite the offshore wind sector's growth in capacity in recent years, it is statistically difficult to contribute to the national energy transitions toward a low-carbon society in the near future even if Taiwan achieves its policy goal set forth to 2025.

B National Capacity

As of 2017, Taiwan expanded its onshore wind capacity to 682.1 MW with 346 turbines. However, none of them is produced by Taiwanese manufacturers. Even though Taiwan had location advantages with many favorable sites for wind farms in order to develop a wind energy industry, turbine manufacturing is component-specialized. Wind turbine production itself is so

³⁶ President Tsai (Tsai, Ing-wen; Taiwanese Mandarin: 蔡英文) has been the President of Taiwan since 2016.

³⁷ Translated by the author from its original name in Taiwanese Mandarin: 2025 非核家園.

highly technology-intensive that geographical location is not enough for a supply chain buildup. (陳中舜, 2018, p. 118). On the other hand, Taiwan had zero offshore wind installation until 2016. (經濟部能源局, 2017, p. 1). Namely, Taiwan had little national capacity in offshore wind technologies with no domestic experience as of 2015.



Although Taiwan's offshore wind came late compared to its onshore sector and facing more pressure in time for actual wind farm construction, Taiwanese government still imposed extremely strict requirements of domestic manufacturing for foreign developers as part of its industrial policy. To Taiwanese government, offshore wind development is not merely an energy policy, but more importantly, an economic policy for national industrial strategy. (陳中舜, 2018, p. 119). While all of the onshore wind equipment was imported from overseas to Taiwan, some of the Taiwanese component manufacturers still took part in the international supply chain. They contributed NTD³⁸ 4.005 billion to Taiwan's economy in 2009.

Still, only a handful of them respectively are able to join the wind turbine production; additionally, the technological levels required for offshore wind are much higher than onshore wind. (陳芙靜 & 李孟諺, 2010, pp. 43-44). Hence, Taiwanese domestic manufacturing power is apparently insufficient in building up a comprehensive local supply chain. In Taiwan's offshore wind development complex, local manufacturers struggled at low levels of market share. Taking the Formosa 1 project³⁹ as an example, Denmark's Ørsted A/S tops the list with 35 percent, followed by Japan's JERA (32.5 percent) and Australia's Macquarie Group Limited (25 percent),

³⁸ NTD is the abbreviation of New Taiwan Dollar, the official currency of Taiwan.

³⁹ Formosa 1 is an offshore wind development project off the coast of Miaoli County (Taiwanese Mandarin: 苗栗縣) in western Taiwan with the investment scale of 627 million dollars for 128 MW in total capacity.

while Taiwan's own Swancor Holding Co. only takes 7.5 percent. (Feigenbaum & Hou, 2020, p. 9).



C Governance

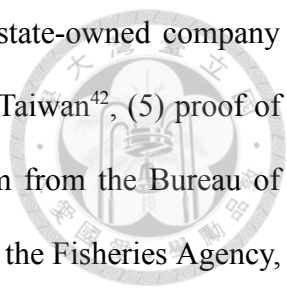
Offshore wind development involves issues in governance including but not limited to environmental protection, shipping lines, national defense, recreational activities and fisheries. From an institutional perspective, the governance of Taiwan's offshore wind is highly centralized. Most of the development plans and projects are substantially influenced, led or instructed by the policies adopted by the central government, within the whole context of national renewable energy developmental strategy. In Taiwan, offshore wind power plants are “electricity generating enterprises” according to the Electricity Act⁴⁰; they are also subject to the Renewable Energy Development Act⁴¹. In both laws, the competent authorities at the central governmental level are the Ministry of Economic Affairs.

Research has listed the required materials for offshore wind farm construction:

In order to receive the permit of construction, the developer must submit the following documents: (1) the environmental impact assessment certificates from Taiwan's Environmental Protection Administration, (2) proof of agreements from the local competent authorities (local governments), (3) proof of agreements on the development of potential sites from the landowners or National Property Administration, (4) proof of

⁴⁰ According to Article 2 of the Electricity Act.

⁴¹ According to Article 3 of the Electricity Act.



agreement on the transmission from Taiwan Power Company, a state-owned company that is the sole one responsible for the electricity transmission of Taiwan⁴², (5) proof of agreement on the installation of the offshore wind turbine system from the Bureau of Energy, Ministry of Economic Affairs, (6) proof of agreement from the Fisheries Agency, (7) proof of agreements from the Civil Aviation Administration and Department of Defense concerning aerospace affairs, (8) proof of agreements from the Coast Guard Administration, Ocean Affairs Council concerning radar-related affairs, (9) proof of agreements from the Department of Defense concerning military affairs, (10) proof of agreements from the Maritime Port Bureau, Ministry of Transportation and Communications concerning marine affairs, (11) opinions from the Council of Agriculture for aquatic animals conservation, (12) proof of agreements from the Bureau of Mines and CPC Corporation⁴³ concerning mining affairs, (13) permit of investigation and delimitation of the submarine cables from the Ministry of Interior, (14) certificate of coastal utilization and management, and (15) certificate of underwater cultural heritage investigation. (饒瑞正, 2021, p. 8).

It is obvious that the procedure of applying for offshore wind farm development is extremely complex. According to Article 14 of the Electricity Act⁴⁴, the regulatory agency of the electricity

⁴² Taiwan Power Company is a Taiwanese state-owned power company according to Article 5 and 6 of the Electricity Act.

⁴³ CPC Corporation is a Taiwanese state-owned company responsible for petroleum and gas

⁴⁴ Article 14 of the Electricity Act, “The electricity industry regulatory authority, in reviewing the application for a permit prescribed in the first paragraph of the preceding article, shall consider the energy policy, Electricity Carbon Emission Factor, national land development, regional balance development, environmental protection, fair competition among electricity enterprises, supply and demand of the electric energy, backup capacity as well as safety of the power systems, in addition to the integrity of the applicant’s plan.” Its original texts in Taiwanese Mandarin, “電業管制機關為前條第一項許可之審查, 除審查計畫之完整性, 並應顧及能源政策、電力排碳係數、國土開發、區域均衡發展、環境保護、電業公平競爭、電能供需、備用容量及電力系統安全。”

industry is the Ministry of Economic Affairs Bureau of Energy; the permit of offshore wind farm development shall accordingly be issued by the Bureau. However, a majority of the items listed above have nothing to do with the Bureau; they are prerequisites for applying for the permit, and belong to different agencies at different levels of governments. In addition, the Act also regulates that when the Bureau is reviewing the permit, many issues must be taken care of including but not limited to energy policy, discharge coefficient of electricity generation, national territorial development strategies, regional development and economic balance, environmental protection, fair competition of the industry, supply and demand management, reserve capacity, and systemic security. Many of the items are not even in the competency of the Bureau of Energy or Ministry of Economic Affairs. (饒瑞正, 2021, p. 7). Therefore, even in the preliminary phase of the preparation of construction a cross-department or horizontal coordination is in need.

In Taiwan, government policy's impact on the environment must be approved by the policy environmental impact assessment⁴⁵ under the environmental impact assessment (EIA) mechanism according to Article 4 of the Environmental Impact Assessment Act⁴⁶. However, the

⁴⁵ Translated by the author from its publicly recognized name in Taiwanese Mandarin: 政策環境影響評估 or simply the abbreviated 政策環評.

⁴⁶ Article 4 of the Environmental Impact Assessment Act, "Terms used in this Act are defined as follows.

1. 'Development activity' means activity designated in Article 5. The scope of development activity includes its planning, implementation and post-completion use.

2. 'Environmental impact assessment' means an environmental management plan based on scientific, objective and comprehensive surveys, forecasting, analyses and evaluations conducted prior to project implementation in order to determine the degree and scope of the potential impact of development activity or government policy on the environment (including the living environment, natural environment and social environment), economy, culture and ecology, and the public explanation and review of such a plan. Environmental impact assessment work includes such procedures as phase I and phase II environmental impact assessments, reviews and follow-up evaluations." Its original texts in Taiwanese Mandarin, "本法專用名詞定義如下: 一、開發行為: 指依第五條規定之行為。其範圍包括該行為之規劃、進行及完成後之使用。二、環境影響評估: 指開發行為或政府政策對環境包括生活環境、自然環境、社會環境及經濟、文化、生態等可能影響之程度及範圍, 事前以科學、客觀、綜合之調查、預測、分析及評定, 提出環境管理計畫, 並公開說明及審查。環境影響評估工作包括第一階段、第二階段環境影響評估及審查、追蹤考核等程序。"

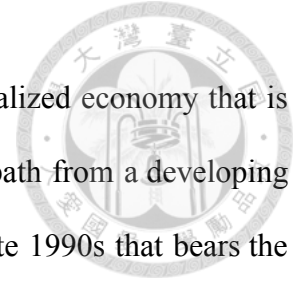
competent authority of this Act is the Environmental Protection Administration (EPA)⁴⁷. Since the competent authority of fishing rights (at the central government level) in Taiwan is the Council of Agriculture of the Executive Yuan⁴⁸, affairs concerning fishing rights are not administered by the Taiwanese EPA. Under Taiwan's system of policy environmental impact assessment, therefore, issues such as fisheries compensation are not initially deemed as a subject matter of the assessment and up for cross-departmental coordination and discussion. (行政院環境保護署, 2016, p. 16).

Consequently, the topic of fisheries compensation at policy implementation level is carved up by different government agencies into different categories: fishing rights for the Council of Agriculture, environmental policy assessment for the Environmental Protection Administration, and regulatory affairs at Taiwanese seas for the Ocean Affair Council. It results in the fact that one of the few policy mechanisms in Taiwan that could encourage public participation in the decision-making process concerning the issue of the conflict between fisheries and offshore wind development policies may fall victim to government bureaucracy.

Until now, there are seldom environmental or development-related cases that have been resolved through institutional means. Most of them were settled or “resolved” through political actions. People in Taiwan, in this kind of cases, tend to resort to protests, contact local representatives, strikes and other sorts of political activities that are easy to be exposed to the public and mass media. However, dispute resolution through the court of law is obviously not an option that fits into this category in Taiwan.

⁴⁷ According to Article 2 of the Environmental Impact Assessment Act.

⁴⁸ According to Article 2 of the Fisheries Act.



Furthermore, Taiwan, from a historical perspective, is a modern industrialized economy that is applicable to the theory of developmental state modernization along the path from a developing to a developed society; it is also a young democracy established in the late 1990s that bears the political legacy originated from its authoritarian background. Its unique historical background results in traits in modern Taiwanese politics such as the inconsistency and disorder in the governing system, lack of experiences in democratic compromise and decision-making, and personal charismatic politics. The legacy imposes disadvantages over democratic Taiwan, leading to government failure, with these characteristics inherited from its authoritarian era. In addition, the single non-transferable voting (SNTV) system escalates political extremism with politician's personal charisma. (Clark & Tan, 2016, p. 141). The authoritarian-featured politics in a democratic era makes the policy-making in Taiwan tend to adopt top-down approaches and instructive-oriented policy implementation.

D The Conflict of Rights

The conflict between offshore wind development and the fisheries in Taiwan to a large extent comes from the rights conflict out of the peculiar design of the Taiwanese regulatory regime governing the fisheries resources.

The Fisheries Act⁴⁹ of Taiwan regulates Taiwanese fisheries activities and resources management. It is also the foundation law for the establishment of the fishing right. In Taiwan,

⁴⁹ The Fisheries Act (Taiwanese Mandarin: 漁業法) is the basic law for fisheries management in Taiwan. It was ratified in 1929 and the last amendment happened in 2018.

fish resources are managed in a seemingly socialist manner: the right to fish is endowed by the regulatory legislation; without regulations, there shall be no right in the first place. (黃異, 2018, p. 85). This ideology is rooted in the idea that the fish resources belong to the state and therefore the government, and government officials can regulate the resources at their discretion. In this kind of jurisprudence, fish resources are merely a matter of regulatory and administrative affairs in the legal system of Taiwan.

In Article 15 of the Act, it defines the fishing rights as follows, “

For the purpose of this Act, the term “fishing right” means any of the following rights:

(1) Set net fishing right: the right to set up underwater rocky cliffs, build fences or install fishing gears within a specific water area for catching or harvesting aquatic animals.

(2) Demarcated fishing right: the right to partition a specific water area for operating aquaculture.

(3) Exclusive fishing right: the right to use a specific water area to form a fishing ground for fisheries access privilege holders to operate one of the following fisheries:

(a) Catching or harvesting aquatic organisms.

(b) Aquaculture.

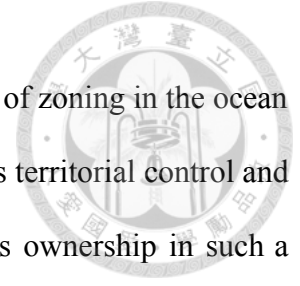
(c) Catching or harvesting aquatic animals with anchored fishing gears within the waters at a depth of twenty-five meters or less.

Only fishermen’s associations or fisheries production cooperatives can qualify as exclusive fishing right holders as referred to in the preceding paragraph.”⁵⁰

⁵⁰ Its original texts in Taiwanese Mandarin, “本法所稱漁業權如左:

一、定置漁業權: 係指於一定水域, 築磯、設柵或設置漁具, 以經營採捕水產動物之權。

二、區劃漁業權: 係指區劃一定水域, 以經營養殖水產動植物之權。



First of all, fishing rights in Taiwan are area-based. It applies the concept of zoning in the ocean in which the government would delineate areas of use of the sea within its territorial control and distribute or bid out them to the potential user. In addition, the righteous ownership in such a right would only be endowed to fishermen’s “associations” or fisheries production “cooperatives”; that is to say, the right is a regulatory arrangement for the interests out of a certain type of natural resources that belong to the state and the government, and can only be exercised by a designated institutionalized social group as a legal person.

Moreover, the Act was ratified in 1929 and most of its contents adopted Japanese regulations on fisheries at the time. (黃異, 2018, p. 86). That is to say, the Act was created at the time when the current Republic of China still based itself outside of the island of Taiwan, and Taiwan itself was under Japanese colonial rule, although it adopted a large portion of Japanese fisheries regulations. It lacks evidence to believe a law that was originally designed for a continental country that was supposed to be one of the largest ones in the world could fit the need and adapt to the special environment of this tropical small island.

Theoretically, whether a right is qualified to the right in private law or that in public law depends upon “the quality of the foundation law” in which it is created to be a private or public law. The foundation law of fisheries regulations in Taiwan—the Fisheries Act is one of the public laws, because the Act is to regulate “the relationships between the state and people involved” within

三、專用漁業權：係指利用一定水域，形成漁場，供入漁權人入漁，以經營左列漁業之權：
(一) 採捕水產動植物之漁業。
(二) 養殖水產動植物之漁業。
(三) 以固定漁具在水深二十五公尺以內，採捕水產動物之漁業。
前項專用漁業權之申請人，以漁會或漁業生產合作社為限。”

the subject matter of the law. Thus, the fishing right that is created by the Act should become a right in public law. However, “as a result of history”, the fishing right is deemed as a sort of private right, or at least a right with a strong feature in private law. (黃異, 2018, p. 86). Namely, as the (exclusive) fishing rights⁵¹ shall be granted by the competent authority⁵² in the matter of issuing the fishing license, the rights are theoretically subjective rights in terms of public law. (陳敏, 2016, pp. 242-283).

However, Article 20 of the Fisheries Act reads, “

*The fishing right shall be considered as a right in rem. Except as this Act otherwise provides, the provisions of the rights in rem of real property in the Civil Code shall, mutatis mutandis, apply.*⁵³

Therefore, ownership of the fishing right has been defined as a sort of real property according to the Act, which brings about the de jure and the ensuing de facto privatization of the fish resources as the time goes on. (張睿寧, 2021, p. 52). However, despite being a “right”, and more likely, a “property right”, fisheries in Taiwan exist by virtue as a license-based system according to Article 6 of the Act. Therefore, in spite of the strong quality of private property embedded into the fishing right, government officials could still annul the right at their discretion simply by revoking or altering it according to Article 29 of the Fisheries Act,

⁵¹ According to Article 15 of the Fisheries Act.

⁵² According to Article 6 of the Fisheries Act.

⁵³ Its original texts in Taiwanese Mandarin, “漁業權視為物權, 除本法規定者外, 準用民法關於不動產物權之規定。”

“The competent authority may alter or revoke its approval to fishing right or suspend the operation of any fishing right, if any of the following circumstances occurs:



- (1) Requirements of national defense.*
- (2) Economic utilization of land.*
- (3) Conservation of aquatic resources.*
- (4) Requirements of environmental protection.*
- (5) Navigation and anchorage of any vessel.*
- (6) Laying of underwater pipelines and cables.*
- (7) Exploration and exploitation of minerals.*
- (8) Requirements of other public interests.*

Before rendering any administrative disposition as referred to in the preceding paragraph, the competent authority shall publicize such disposition in advance and notify all fishery operators concerned.

Where the administrative disposition as referred to in paragraph 1, cause any loss to the fishery operator, the relevant competent authority or the party claiming alteration, revocation, or termination shall reconcile the operator to make appropriate compensation for the losses. Should the reconciliation fails, the central competent authority shall decide the content of the compensation.”⁵⁴

⁵⁴ Its original texts in Taiwanese Mandarin, “

有左列各款情形之一者, 主管機關得變更或撤銷其漁業權之核准, 或停止其漁業權之行使:

- 一、國防之需要。
- 二、土地之經濟利用。
- 三、水產資源之保育。
- 四、環境保護之需要。
- 五、船舶之航行、碇泊。



In addition, by analogy, the usufruct of water resources adheres to the idea of public property in special use (öffentliche Sachen im Sondergebrauch). In that sense, the usufructuary therefore owns the right to make use of such resources for certain purposes under official grants from the government. In the case of fishing rights, it is articulated in the second part of Article 6 of the Fisheries Act. Some also argue that, while such rights are considered as rights in rem of real property, in the application of analogy in law (*mutatis mutandis*), they shall be limited to a proper degree. (葉進雄, 2007, pp. 163-164). As a result, when it comes to the government seizing of the right to fish in the current regulatory regime, the fishing right is “altered” or “revoked”⁵⁵ by the competent authority for its approval but not “expropriated”, according to Article 29 of the Fisheries Act; that means it does not constitute the expropriation that is equivalent to constitutional takings.

1. Taiwan’s Fisheries and the Public Trust Theory

The fact that government officials can decide at their discretion whether and how to issue or revoke a “right” proves the socialist nature of Taiwanese legal regime toward natural resources—the resources per se belong to the nation. They are “public” resources. It resembles one of the fundamental spirits of the public trust theory. Traditionally, the public trust refers to a doctrine, which is a common law principle that has been used to defend government

六、水底管線之鋪設。

七、礦產之探採。

八、其他公共利益之需要。

主管機關為前項處分前，應先公告，並通知各該有關之漁業人。

因第一項之處分致受損害者，應由目的事業主管機關或由請求變更、撤銷、停止者，協調予以相當之補償；協調不成時，由中央主管機關決定。”

⁵⁵ According to the first part of Article 29 of the Fisheries Act.

actions/conducts against claims for regulatory/constitutional/categorical takings. It has been long cited (while sometimes controversial) in property law, administrative law and regulations. However, deep in the nature of public trust is the balance of competing rights between the private and the public. It is often interpreted as a status in which certain natural resources belong to the public and cannot be privatized even if they are affiliated to private property. The state, as the trustee, has the control of those resources, and cannot sell off or transfer them without the consent of the public. Sometimes, even with the consent of the public, some critical resources cannot be transferred to the hands of the private since they are not only for the use of the public, but also for that of future generations.

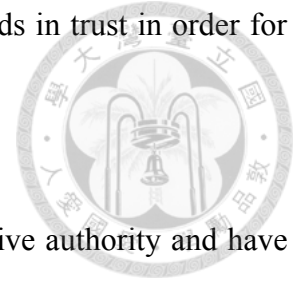
In common law, with respect to the public usage of property, the basic idea is enshrined in the case of *Arnold v. Mundy (1821)*, where the Chief Justice Kirkpatrick stated, “the sovereign power itself... cannot, consistently with the principles of the law of nature and the constitution of a well ordered society, make a direct and absolute grant of the waters of the state, divesting all the citizens of their common right. It would be a grievance which could never be long borne by a free people.”⁵⁶ Stemming from the notion of common rights, in the 1840s, the term *public trust* has eventually made its debut in the case of *Martin v. Waddell (1842)*, in which the Supreme Court held that, “the shores, and rivers, and bays, and arms of the sea, and the land under them... (were) held as a public trust for the benefit of the whole community...”⁵⁷; and in the case of *Illinois Central Railroad Company v. Illinois (1892)*, with the law ruling, “(the land concerned were) held in trust for the people of (Illinois).”⁵⁸ The contemporary idea of public trust doctrine

⁵⁶ *Arnold v. Mundy*, 6 N.J.L. 1, 78 (N.J. 1821). Chief Justice: Andrew Kirkpatrick (1756–1831).

⁵⁷ *Martin v. Waddell*, 41 U.S. 367 (1842).

⁵⁸ *Illinois Central Railroad Company v. Illinois*, 146 U.S. 387 (1892).

was thereby established in the world of common law where the state holds in trust in order for public access to certain resources.



Sax (1970) stated that states may not divert themselves from the legislative authority and have special obligations over the public trust assets when he commented on the *Illinois Central Railroad Company* case⁵⁹. While “mere granting of property to a private owner does not *ipso facto* prevent the exercise” of the state’s police power in which it has the responsibility, a “good reason” is still required. He also maintained that the applicable scope of such doctrine was expanded into a legal standard for the civil society to preserve and prevent environmental sustainability and natural resources from inappropriate exploitation by the government and the private sector. In its ideological norms, environmental protection and preservation were made the top priority in order for the public good. At the time when the environmental movement flourished, the case of *National Audubon Society v. Superior Court Alpine County* (1983)⁶⁰ (hereinafter “the *Mono Lake* case”) has demonstrated the frenzy for the protection and conservation of natural resources; in the meanwhile, Lazarus (1986) argued that the legislative branch has already been able to manage environmental issues in the support of scientific expertises, and pointed out the fact of the over-reliance on judicial judgment in search of the solution as its competence appears questionable.

⁵⁹ *Id.*

⁶⁰ *National Audubon Society v. Superior Court of Alpine County*, 658 P.2d 709 (Cal. 1983).

2. Taiwanese Problems



One of the trickiest problems here is that, in Taiwan, the trustee—the state seizes control of those resources, fish resources particularly here, did not consider the interest of the future generations. In their area-based fishing licenses, those fisheries (the designated area for fishery operators to execute their exclusive fishing rights) would be eliminated from the map once the government revokes the licenses for the construction of offshore wind farms. Those areas will no longer be accessible to the public for fishing activities in the future. The public, especially the future generations, will lose their right to access to those public resources at the point when the government zones the sea area to the offshore wind developers.

However, constructing offshore wind farms and developing ocean renewable energy are other kinds of public interests. The government policies in the administration and legislature, as an embodiment of the public interests, decide to make a policy change on the plotted use of the ocean resources from fisheries to offshore wind development is also a democratic decision. The conflicting public interests and the peculiar feature of fishing rights as a private property right (the right *in rem*) result in the complicated conflict of rights between the government, local people, and offshore wind energy developers.

Hence, when it comes to “expropriation”, the backlash from the fishery operators—the socially supposed rightful owners of the fishing right would come much more fiercely and extremely than expected. In coastal counties such as Miaoli (Taiwanese Mandarin: 苗栗) and Changhua (Taiwanese Mandarin: 彰化), local people, although they expressed supportive opinions toward

offshore wind development, remained suspicious of the validity of the fisheries compensatory mechanism, decision-making process, participatory system and others. (周桂田 & 張國暉, 2017, pp. 169-185). In June 2013, for instance, local fishing operators in southern Hsinchu county opposed the overall development of offshore wind farms⁶¹.



In the case of Changhua County, nearly 80 fishing boats in July 2015 went under protest and encompassed the tribune roots which were still under construction because of their dissatisfaction on the incomplete performance of the MOU⁶² signed earlier by the developers with the local fisher's association⁶³. Large-scale protests also happened in Yunlin County through the year of 2020; other than protests at local level, fishing operators in Yunlin also petitioned to the Legislative Yuan (the legislative branch of the Government of Taiwan). The protest eventually ended up with the intervention of the police forces and the central government. (張睿寧, 2021, p. 82). In the northern coast, local fishing operators claimed that they would oppose the development at all cost. (孫文臨, 2020). Overall, in Taiwan, the issues arising from offshore wind power development have evolved into a highly politicized problem.

Another is the compensatory policy itself. A platform of negotiation and reconciliation between the fishery operator and those whose interests are concerned was established according to Paragraph 2 and 3 of Article 29 of the Fisheries Act. The platform by itself is full of good intentions; however, it ignores the state responsibility within. The government, which is the exact

⁶¹ 台灣風力發電產業學會. (2013). 〈竹南離岸風力發電計畫 首次環評出師不利〉. http://www.twtia.org.tw/Industry_List_m.aspx?id=4380.

⁶² MOU is the abbreviation of memorandum of understanding, which is a form of agreement in law between two or more parties.

⁶³ 自由時報. (28 July 2015). 〈離岸風力發電施工 80艘漁船抗議〉. <https://news.ltn.com.tw/news/local/paper/901562>

conductor of the expropriation, appears as the moderator instead of the counterpart of the negotiation. Under this policy, in addition, the final decision on the content of the compensation could be solely made by the competent authority from the central government if the above-mentioned negotiation fails. There is no way for any party of interest to get involved or engaged in the decision making process. The lack of fair channels or means for stakeholders to participate in the process has pushed them away toward political approaches and made them seek for those out of the institution.

What's more, the compensation policy of such an "expropriation" designed by the government is simply conducted in a monetary form and the amount will simply be calculated by a formula called the Criteria of Fisheries Compensation for Offshore Wind Power Plant⁶⁴ designed by the competent authority⁶⁵. Aside from the monetary compensation, while the government pledged to help local fishery operators to acquire necessary equipment and skills in the newly upgraded industry or pursue other careers, those promises, nevertheless, often bring little confidence to the public. At the same time, the governmental accountability itself is, at least from the perspective of local communities, in great public doubt thanks to piles of its own notorious records in history⁶⁶. As a result, conflicts are inevitably stirred up among the stakeholders and authorities upon lack of mutual trust and confidence.

In practice, offshore wind energy developers in Taiwan are typically required by laws to pay two kinds of compensation: the one that is required by the Regulations Governing the Use of Fund to

⁶⁴ Translated by the author from its original title in Taiwanese Mandarin: 離岸式風力發電廠漁業補償基準.

⁶⁵ The Council of Agriculture, Executive Yuan (Taiwanese Mandarin: 行政院農業委員會)

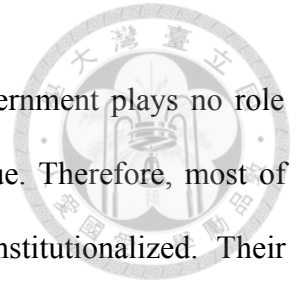
⁶⁶ 台灣環境資訊協會環境資訊中心. (27 September 2017). 〈都是為了錢? 離岸風機帶動漁村共榮? 彰化漁會觀點〉. <https://e-info.org.tw/node/207497>

Facilitate the Development of Electric Power⁶⁷ and the one calculated by the Criteria of Fisheries Compensation for Offshore Wind Power Plant. The former one is planned for the local communities as a whole and will be submitted to the local authority; only the latter one is for the righteous owners of the fishing rights—the fisheries associations. Surprisingly, there is no law in which the fishing operators themselves could be compensated individually; that is to say, individual fishing operators have no legal standings upon the issue.

Moreover, the fisheries associations often demand “third payments” that are not written in any law or regulations. On the condition that one of the permits the developer needs to acquire from the Fisheries Agency of the Council of Agriculture in order to be admitted to the construction requires the agreement with the local fisheries association, the developer needs to contact the association by itself and ask for the signature. However, the association will defer the signing until the developer provides sufficient benefits or satisfies their requests. Those benefits and requests are called the “third payments” that mean the payment outside of the two required by the law mentioned above. The payments vary from case to case, and they are all huge financial risks and demerits for the developers as they are responsible for their investors, loaners and stakeholders. The system engenders a deadlock between the fisheries association and developer since the developer has no reason to pay things that are not written in any law or contracts, and the fisheries association considers the lawful compensation is not enough at all. As a result, the developer will petition the issue to government officials and ask for their intervention. (張睿寧, 2021, pp. 49-57).

⁶⁷ Translated from its original title in Taiwanese Mandarin: 電力開發協助金運用與監督管理辦法. Also see 公共政策網路參與平台. (2021).〈經濟部公告:預告「電力開發協助金運用與監督管理辦法」第6條之1、第9條及第7條附表修正草案〉. <https://join.gov.tw/policies/detail/8e06614f-6ba1-4cda-aaa6-210285cb661e>

One of the problems here is that this is an institution in which the government plays no role during the negotiation; the government has no proper stance on the issue. Therefore, most of them ended up with political compromises by means that are not institutionalized. Their solutions require politics and politicians, making the whole development issue much more politicized again and again.



Chapter 3: Offshore Wind in the UK



The UK managed to reduce its greenhouse gas emissions to half of that compared to the average based on 20 years ago. One of the reasons is that the UK has successfully transformed its economic structure into a state in which the economic growth can decouple with energy consumption; another major reason is that it has been augmenting its reliance on renewables as its primary energy sources. One worth noting is that the UK has fully opened its electricity market after several electricity market reforms; however, many companies in the early stages showed little interest due to the uncertain risks of long-term investment. (饒瑞正, 2021, pp. 252-253). In response, the UK made a series of reforms and designed a series of policies in promoting the development of renewables, among which offshore wind energy is one and maybe the most important components.

A Policy Preferences and Political Attitudes

The Crown Estate is in charge of British assets at sea. Developers that are willing to participate in the offshore wind development projects need to consult with it. They have to apply for an exclusivity agreement and complete several prerequisites, including appointing the preferred site for development, submitting the development plan, receiving approval from the environmental

impact assessment and reaching consensus with the fishing operators whose interests are concerned. In the UK, communications and negotiations with the stakeholders will usually kick off in the very early stage and continue throughout the whole process; the developer has to contact the local communities and provide accurate, complete and correct information prior to the submission of the application for the wind farm construction. (蔡佳珊 & 程怡綾, 2021).

According to the UK Offshore Wind Development Pipeline published by the Crown Estate, the UK has set a policy target of 40 GW installation by 2030 and aims to reach up to 125 GW goal in capacity by 2050 within the net zero scenarios⁶⁸. It has so far released four rounds of offshore wind farm development projects. (張睿寧, 2021, p. 157). Per the paper, there has already been 10 GW in operation; another 10 GW has been committed; 19 GW is under development and another 18 GW is looking for potential leasing⁶⁹.

In December 2000, the Crown Estate started to accept Round 1 applications; the result was published in April 2001. Round 2 applications were opened in July 2003 in which the famous London Array was included. Moreover, Round 3 was launched in June 2008. (陳芙靜 & 李孟諺, 2010, pp. 27-28). The Crown Estate launched a pre-registration period and set up a special portal for those who have registered their interest in this Round when it announced the Invitation of Negotiate (ITN) process. It was followed with five distinct phases: submission, preliminary evaluation, finalization of zones post outcome of the UK government's Strategic Environmental Assessment (SEA) short listing negotiation, and execution of the Zone Development Agreement (ZDA) and related security packages. Unlike the previous two rounds, the Crown Estate will

⁶⁸ For more information, *see*

<https://www.thecrownestate.co.uk/media/3706/overview-of-uk-offshore-wind-development-pipeline.pdf>

⁶⁹ *Id.*

become one of the direct investors and “jointly invest with its chosen development partner to fund up to 50 percent of consenting costs incurred in accordance with an approved budget up to the point of achieving the Key Consents (those required to commence construction) for each wind farm development.” (Msimang & Doble, 2008).



Following the publication of a White Paper on energy by the UK Department of Trade and Industry, the Parliament passed the Climate Change Act 2008⁷⁰ that is the first binding law in the world for climate change mitigation and adaptation. (葉俊榮 *et al.*, 2020, p. 97). The ratification of the Climate Change Act 2008 was a milestone for the UK renewable energy development. The law covered the whole kingdom and accompanying islands, attempting to transform the society from energy consumptions to ways of living. It did not detail the regulations but authorized the competent authorities to regulate, and required stakeholders’ participation in the process. The law also established the Committee on Climate Change⁷¹ and amended the provisions of the Energy Act 2004⁷². It further built up an Emission Trading System (ETS) and a Carbon Budgeting System that requires the plannings be on a five-year regular basis in budgeting relevant measures where they would be given advice from the Committee on Climate Change. (葉俊榮 *et al.*, 2020, pp. 97-99).

In 2009, the Marine and Coastal Access Act was promulgated, and the Marine Management Organization (MMO) was established accordingly. The MMO is an organization in charge of

⁷⁰ 2008 c. 27.

⁷¹ The Committee on Climate Change (currently the Climate Change Committee) is an independent non-departmental public body, formed under the Climate Change Act (2008) to advise the United Kingdom and devolved Governments and Parliaments on dealing with and preparing for the challenge of climate change.

⁷² 2004 c. 20.

marine planning and management; the developer is required to apply to the organization for a permit in order to conduct construction activities at sea. (蔡佳珊 & 程怡綾, 2021). In 2011, the Department for Environment, Food and Rural Affairs (Defra) further published the UK Marine Policy Statement that serves as “the framework for preparing Marine Plans and taking decisions affecting the marine environment. It has been prepared and adopted for the purposes of section 44 of the Marine and Coastal Access Act 2009” and aimed “to contribute to the achievement of sustainable development in the United Kingdom marine area”⁷³.

In 2013, the British government launched the Electricity Market Reform that introduced the Contracts for Difference (CfDs) in order to support renewable energy technologies against the volatile electricity prices and gradually replace the previously-implemented Renewable Obligations Certificate system⁷⁴ that was invented by the Electricity Act of 1989⁷⁵ and Utilities Act of 2000⁷⁶. (葉俊榮 *et al.*, 2020, p. 106). A CfD is basically a long-term contract bound between the electricity provider and low carbon contracts company (LCCC). If the market electricity price is lower than the set strike price, then the LCCC would recover the gap, and *vice versa*. (饒瑞正, 2021, p. 253). Following the passage of the Energy Act 2013⁷⁷, the reform enabled the government to establish “a pre-set level of support to renewable energy operators”

⁷³ Retrieved on August 23, 2022 from the UK government website:

<https://www.gov.uk/government/publications/uk-marine-policy-statement>

⁷⁴ One unit of Renewable Obligations Certificate (ROC) represents one megawatt hour (MWh) that is used to measure electric output equivalent to one thousand kilowatts of electricity generated per hour. Any electricity provider can receive the certificate if it meets the criteria for renewable energy. The certificate is issued monthly by the Office of Gas and Electricity Markets (Ofgem) and transferable. Eligible energy companies shall ensure they provide renewable energy at a certain rate that is gradually increasing year by year. Companies can satisfy the requirement by submitting equivalent ROCs or paying fees to the Ofgem. The payment that the Ofgem receives would be used to subsidize renewable energy generation.

⁷⁵ 1989 c. 29.

⁷⁶ 2000 c. 27.

⁷⁷ 2004 c. 20.

through “hedge contracts in the wholesale electricity market”: the CfD can “either support the operator or make the operator pay back” when the market price is above the government-determined preset level. However, this system also encountered criticism that it may impose more uncertainty for investors with respect to the nature of wholesale price changes. (Graziano *et al.*, 2017, p. 717). Still, the measure has managed to lower the largest concern of the investors—the financial risk of such a long-term commitment; as a result, the capacity of renewables in the UK skyrocketed. (饒瑞正, 2021, p. 253).

In 2016, the UK revised and passed the Energy Act 2016 in which the Oil and Gas Authority was officially established in order to regulate the oil and gas industries in the UK. It also passed the Climate Change Act 2008 (2050 Target Amendment) Order 2019 after a decade since the statute has been created. In the Order, the UK raised its carbon reduction goal up to 100 percent from the original 80 percent by 2050, and the sixth carbon budget published in September 2020 by the Committee on Climate Change would be the first on abiding by the new goal. On the other hand, the Scottish government also revised its policy goal of carbon reduction ahead of the whole nation by five years to net zero by 2045 in its Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. (葉俊榮 *et al.*, 2020, p. 100).

The Round 4 of British offshore wind leasing kicked off in the late 2010s. According to the official website of the UK government, it was plotted clearly into 5 stages: (1) the Pre-Qualifying Questionnaire (PQQ), (2) Invitation to Tender Stage (ITT Stage 1), (3) Invitation to Tender Stage 2 (ITT Stage 2), (4) Plan-Level Habitats Regulations Assessment (HRA), and (5) Agreement for Lease. The PQQ was to assess potential bidders’ financial capability, technical experience and

legal compliance; the applicants who passed the stage are pre-qualified bidders. In Spring 2020, with the completion of the PQQ, the Crown Estate launched ITT Stage 1 for further assessment and negotiations through summer 2020. The ITT Stage 2 was split into two phases: the first from autumn 2020 and the second from early 2021. This was a multi-cycle bidding process that used option fees bid to determine bidders' awards. In the fourth stage, the HRA, the Crown Estate would undertake an assessment as a competent authority and consider the possible impacts of Round 4 on the network of protected areas at sea. After all these, on July 15, 2022, the Crown Estate launched the last stage of the new round of the offshore wind development bids, following confirmation by the Secretary of State for Business, Energy and Industrial Strategy, on the condition that the Welsh government has not raised any objections.⁷⁸

B National Capacity

However, the United Kingdom was once considered a passive player with poor performance in the field in the early years⁷⁹. (Toke, 2011, p. 527). While the world commenced work on developing green energy after the oil shock in 1973, the UK had few engineers trained in wind energy technologies that were concluded as “a medieval concept which does not fit the contemporary world”. This caused the “lost decade of the 1970s” in which the UK fell behind in production in the wind industry and became “a net importer” of wind technology. For example, the first large-scale 55 kW⁸⁰ wind power generator installed in the Orkney Isles⁸¹ in 1981 came

⁷⁸ Retrieved on August 28, 2022 from the official website of the Crown Estate:

<https://www.thecrownestate.co.uk/round-4/#:~:text=Offshore%20Wind%20Leasing%20Round%204%20creates%20the%20opportunity%20for%20at,to%20net%20zero%20by%202050>

⁷⁹ Also see Mitchell & Connor (2004) and Mitchell *et al.* (2006).

⁸⁰ KW is the abbreviation of kilowatts. 1 kW is equivalent to 1,000 Watts.

⁸¹ Orkney Islands is an archipelago in the Northern Isles of Scotland.

from Denmark, and another 200 kW one installed at Carmarthen Bay⁸² came from the United States. However, the government at the time paid no heed to wind energy and was reluctant in carrying out policies or investment programs when the counter-oil shock by 1985 had “collapsed the oil prices” with the wind energy “not supported by environmentalist movements”. (Graziano *et al.*, 2017, p. 716).

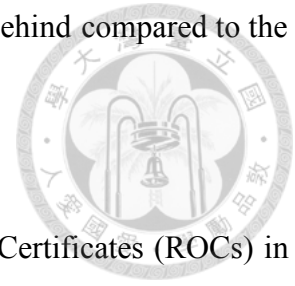
In order to catch up with its European counterparts, the Parliament passed the Electricity Act in 1989 that included the invention of Non-Fossil Fuel Obligation (NFFO), demanding new private Regional Electricity Companies (RECs) to purchase non-fossil fuel generated power at levels set by the Secretary of State for Energy⁸³. In fact, the NFFO was “originally designed to promote nuclear power”. Surprisingly, it has been proven successful in the wind sector at the early stage and “encouraged optimism in renewables” especially with the emerging offshore wind development. However, given the policy itself was not for renewable energy development, the government failed to promote local content, R&D⁸⁴ and did not increase the NFFO quota for wind energy. Furthermore, the European Commission ruled in 1990 that the NFFO policy was against the fair competition rule since it was a convert subsidy to nuclear power. The investments were then frozen or alienated from the wind sector for its high upfront cost. (Graziano *et al.*, 2017, pp. 716-717). When Demark put into operation the very first offshore wind farm in the

⁸² Carmarthen Bay is an inlet of the South Wales coast.

⁸³ The Secretary of State for Energy as head of the Department of Energy was a British government cabinet position from 1974 to 1994 until the Department of Energy was dissolved and merged to the Department of Trade and Industry. In 2008, the establishment of the Department of Energy and Climate Change (DECC) revived the post as the Secretary of State for Energy and Climate Change. In 2016, the DECC was merged with the Department for Business, Innovation and Skills (BIS) and reformed into the new Department for Business, Energy and Industrial Strategy (BEIS) in which the Minister of State for Business, Energy and Clean Growth as a mid-level position in BEIS took the portfolio.

⁸⁴ R&D is the abbreviation of research and design.

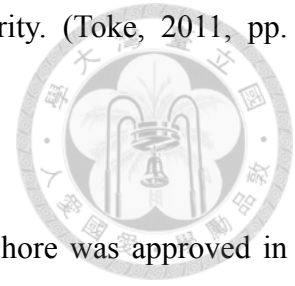
world in 1991 (Rock & Parsons, 2010, p. 2), the UK had already fallen behind compared to the rest of Europe due to lack of incentives.



In 2002, the UK came up late with the policy of Renewable Obligations Certificates (ROCs) in replacement of the NFFOs. It required electricity suppliers to gradually increase the proportion of renewable sources in their power supply. (Graziano *et al.*, 2017, p. 717). At first, that was criticized for providing too little long-term financial security and incentives for business investment. In response, the British government has conducted a wide array of policy innovation. (Toke, 2011, pp. 527-528). First of all, according to Toke (2011), it reinforced a policy planning regime by replacing the system in which local planning authorities could declare “no go” zones with a criteria-based evaluation system toward the proposed projects; developers could also appeal to the government if they are rejected for their planning applications. The system was designed for onshore wind plannings in the first place. However, this approach also successfully established a policy model for emergent offshore wind development. Furthermore, it expanded the Renewable Obligation system up to 20 percent of electricity by 2020 at the initial stage and authorized the ministers to extend the target if needed. This expansion was conducted under the context of the EU Renewable Energy Directive⁸⁵ that set a target for the UK of supplying 15 percent of its energy consumption from renewables by 2020. Moreover, it provided incentives for offshore wind and related technologies and introduced feed-in tariffs with support for smaller renewable energy projects. The government also gave precedence in marine planning considerations on the allocation of offshore wind farm leasing areas ahead of other kinds. Aside from the previous market-based mindset, the government adopted more interventionist approaches in order to provide precise support for the development of certain renewable energy

⁸⁵ Directive 2009/28/EC. April 23, 2009.

technologies in which the offshore wind sector was treated as a priority. (Toke, 2011, pp. 527-529).



In practice, the first offshore wind case—the development of Blyth Offshore was approved in 1996. (陳芙靜 & 李孟諺, 2010, p. 26). After its completion in 2000, the first offshore wind farm⁸⁶ in the UK eventually set out under business operation off the coast of Blyth in North East England. (Crabtree *et al.*, 2015, p. 728). Since then, the UK has managed to scale up both its domestic market and international export by building up a comprehensive offshore wind technology cluster and industrial supply chain. (Offshore Wind Industry Council, 2018, pp. 10-18). The Renewable Obligation policy scheme took a significant role in helping British wind development. In the period from 2000 to 2014, the UK wind power capacity has grown from 425 MW to 12,809 MW. (Graziano *et al.*, 2017, p. 717). Since 2010, the scheme has been associated with a new Feed-in Tariffs (FiTs) structure that was especially designed to encourage small-scale renewable electricity generation technologies up to 5 MW. They coordinatively promoted long-term investments with guaranteed prices through the 2030s. (HM Government, 2013).

C Governance

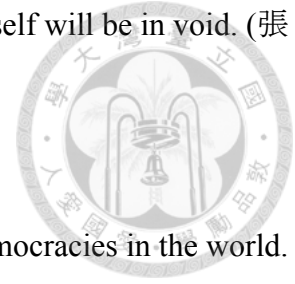
From an institutional perspective, the governance of the UK's offshore wind is decentralized, but highly coordinated. At the central level, the Department for Business, Energy and Industrial Strategy (BEIS) is in charge of the grand strategy and policy-making at the national level; and the Crown Estate is responsible for the development activities. The BEIS is also the competent

⁸⁶ The Blyth Offshore Wind Farm, the UK's first offshore wind farm, was a small-scale offshore wind farm approximately 0.6 mile (1 km) off the coast of Blyth, Northumberland, (North East) England. *see* Wilson (2007), p. 9.

authority of the Climate Change Act, at the central (national) level; the implementation of the Act would be authorized to different local authorities, the Scottish Ministries in Scotland, Welsh Ministries in Wales, and Relevant Northern Ireland Department in Northern Ireland. (葉俊榮 *et al.*, 2020, p. 101). In 2009, the executive devolution agreement was passed, and the Scottish ministries were authorized to make decisions and regulate in accordance with their local situations. According to the Marine and Coastal Access Act, the government was required to conduct marine spatial planning (MSP). The UK government set up the Marine Management Organization (MMO) in order to conduct MSP in England and Wales accordingly; in Scotland and Northern Ireland, they should be conducted by their devolved governments under the requests of the Act which were respectively made in 2010 and 2013. (張睿寧, 2021, p. 158).

Seabed right is the initial and one of the most important steps for offshore wind development in the UK. Initially, at the national strategic planning process, the Department for Business, Energy and Industrial Strategy (BEIS) will conduct the Offshore Energy Strategic Environmental Assessment (OESEA); the developer can submit the final proposal after being awarded the Zone Development Agreement (ZDA) issued by the Crown Estate and complete regional research. Once submitted, the developer can apply to the Crown Estate for the Agreement for Lease (AfL) of the seabed right. One worth noting is that the AfL does not grant the right of development but allows the developer to conduct investigation and research of the sea area, deploying seabed research equipment and probing, for instance. In order to apply for the Zone Development Agreement (ZDA), the developer is required to negotiate with the stakeholders in advance. Until all of the prerequisites (in the AfL), including the environmental impact assessment, are fulfilled,

the developer will not be allowed for construction; once failed, the AfL itself will be in void. (張睿寧, 2021, pp. 152-154).



From a historical perspective, the United Kingdom is one of the oldest democracies in the world. Since the Magna Carta was decreed in the 13th century by King John of England, for a long time, British democracy has been a role model for representative democracy. It is still one of a kind. Moreover, the British parliamentary politics, also known as the Westminster system, is said to be one of the most consensual compared to other kinds of politics.

Beyond being one of the most successful democratic countries in the world, the UK continues to lead the global progress and development of the state of democracy with several major constitutional reforms in the recent century. One of them is the devolved governments. Throughout the process of devolution, the UK realized the decentralization of public governance and transferred a large portion of government power to the local level. This major political and democratic experiment created a federal system under a unitary state. It not only guarantees four of its constituent countries, Scotland, Northern Ireland, England and Wales, more autonomy and self-determination, but also balances democracy and efficiency in public governance. For example, the UK government also publishes the Guide to Offshore Wind Farm (Catapult, 2019) provided on behalf of the Crown Estate briefing and answering the questions concerning the procedural process of offshore wind development and its services, while the central government does not intervene in local decision-making at all. The policies that involve seas at Scotland and Northern Ireland are up to their governments' own discretion, and the Crown Estate will only

proceed with the bid in England and Wales on the condition that the Welsh government does not raise objections.



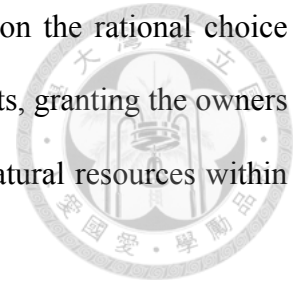
D The Conflict of Rights

The United Kingdom is facing less if not the least opposition from the local communities concerning the construction of offshore wind farms. One of the key policies is that the UK requires public communications and even negotiations with local communities prior to the issuance of the permit of development. However, it had as well encountered some of the difficulties and/or challenges that many of the rising offshore wind markets are now facing before it became the leader of the industry.

1. UK Fisheries and the Licensed Property

Throughout history, natural resources out of the territory of property are generally considered common and free for public use. However, the scarcity of certain resources with environmental and ecological considerations have made the modern managerial institution of natural resources prone to privatize them to some extent in order to avoid the tragedy of the commons. In the United Kingdom, fish resources at open sea, in general, are regarded as a sort of natural resource as a common property. For centuries in the past, they were usually open for free fishing. However, in modern society, they belong to natural resources in a common pool that has limited supply and suffers from the problem of species extinction. Instead of adopting the traditional type of regulatory tools provided by the command-and-control approach, most of the policies

follow the public choice theory with the market-based approach based on the rational choice theory. In practice, the government often issues licenses or tradable permits, granting the owners privileges to certain economic interests upon the use of certain sort of natural resources within the designated scope.



The concept of licensed property will be introduced here in explaining the ideological origin of license holders—the fishing operators as they are opposing the construction of offshore wind farms. The concept was devised by Leigh Raymond (2003) in his book *Private Rights in Public Resources*⁸⁷. A licensed property, according to Raymond, is a kind of private property which is given rise to by market-based policies; it, while falling short of a fully vested right, remains quite recognizable as a form of ownership. That is to say, these rights are a licensed form of property. They have many, but not all, of the powers typically assigned to a vested property right; yet like any other legal license, they remain formally subject to government adjustment or cancellation without compensation. (Raymond, 2003, p. 187). In traditional legal scholarship, there is a distinctive line distinguishing between private ownership in property law and public resources management based on regulations. In principle, private property in common law is an unequivocal right of absolute ownership and protected by the Bill of Rights, specifically the takings clause of the Fifth Amendment and the Fourteenth Amendment⁸⁸ which extends its

⁸⁷ Raymond, L. (2003). *Private Rights in Public Resources*. Washington, D.C.: Resources for the Future.

⁸⁸ Amendment XIV to the United States Constitution, “

Section 1 All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.

Section 2 Representatives shall be apportioned among the several States according to their respective numbers, counting the whole number of persons in each State, excluding Indians not taxed. But when the right to vote at any election for the choice of electors for President and Vice-President of the United States, Representatives in Congress, the Executive and Judicial officers of a State, or the members of the Legislature thereof, is denied to any of the male inhabitants of such State, being twenty-one years

application to those outside the federal level, against public or regulatory takings. On the other hand, interests and rights bestowed upon licenses and permits that are created by regulations are precluded from the protection of the takings clause. Aside from jurisprudence, regulatory policy and law makers will avoid the term of property and the equivalent to keep the issue from normative debates.

In empirical observations, the idea of property throughout history varies from time to time under different legal and political philosophies; it is difficult to assume a universal definition of property. In the modern era, generally speaking, the concept of property consists of a bundle of rights, and many of them are legally separable from one another. Raymond (2003) further stated some important elements raised include (1) use, including control over revenue generated; (2) exclusion; (3) security, including protection against forced transfer; (4) alienation; (5) bequest; and (6) destruction. A fully vested right in property contains all of them—all of the fragmented powers of ownership; in contrast, a licensed property has at least one of them in a weakened form (Raymond, 2003, pp. 16-17) and does not qualify as a private property *de jure*. Many types

of age, and citizens of the United States, or in any way abridged, except for participation in rebellion, or other crime, the basis of representation therein shall be reduced in the proportion which the number of such male citizens shall bear to the whole number of male citizens twenty-one years of age in such State.

Section 3 No person shall be a Senator or Representative in Congress, or elector of President and Vice-President, or hold any office, civil or military, under the United States, or under any State, who, having previously taken an oath, as a member of Congress, or as an officer of the United States, or as a member of any State legislature, or as an executive or judicial officer of any State, to support the Constitution of the United States, shall have engaged in insurrection or rebellion against the same, or given aid or comfort to the enemies thereof. But Congress may by a vote of two-thirds of each House, remove such disability.

Section 4 The validity of the public debt of the United States, authorized by law, including debts incurred for payment of pensions and bounties for services in suppressing insurrection or rebellion, shall not be questioned. But neither the United States nor any State shall assume or pay any debt or obligation incurred in aid of insurrection or rebellion against the United States, or any claim for the loss or emancipation of any slave; but all such debts, obligations and claims shall be held illegal and void.

Section 5 The Congress shall have the power to enforce, by appropriate legislation, the provisions of this article.”

of natural resources have long been managed under this concept for decades, including but not limited to licensure for forestry, federal grazing permits, transferable allowances for sulfur dioxide (SO₂) emissions⁸⁹, and mining permits. Among them, one of the most prominent examples is the system of individual transferable quotas (ITQs) for fish resources—a subject matter of the research.

Theoretically, they are regulation-endowed ownerships; in effect, still, this establishment created an entitlement to certain economic resources. It is different from a mere license granting a right in regulatory terms that has nothing to do with property, and it's also different from a fully vested right in property. However, the fact that a licensed property is not conferred full ownership in terms of property law does not disavow the fact that such a property is of significance and be seen as a sort of property from a sociological aspect. Such type of ownership is created by regulatory legislation and exists at the discretion of the public officials; nonetheless, despite the fact that it is still a right established under the managerial mechanism of the public resources, this market-based environmental policy approach has, from a constructivist perspective, privatized the natural resources. Pappas (2018) proposed the notion of property disclaimers, arguing that a special form of property interests emerged and has been treated as ordinary private property between private individuals; nevertheless, it is treated as an unprotected interest between individuals and the government under the circumstances in which the market-based regulatory mechanisms gained popularity and new regulatory schemes arose in recent times. In reality, private parties would invest a fortune on disclaimed properties for which the government explicitly disavows constitutional protections arising under the takings and due process clauses.

⁸⁹ This renowned system of transferable allowances for air pollutants was created by the 1990 amendments to the Clean Air Act.

(Pappas, 2018, p. 394). The theory provides an essential aspect in observing the nature of licensed property.



2. The British Solution

The UK completed its first offshore wind farm in Blyth in 2000; the government took the three-stage strategy at the time. However, the project has met a lot of obstacles and cost additional time and money since the beginning for lack of coordination and public communications. (蔡佳珊 & 程怡綾, 2021). In response, the Crown Estate in 2002 set up the Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW) in order to “promote relationships between the fishing and offshore renewable energy sectors”, and to “encourage co-existence of the industries across the UK”. The official website of the UK government states, “the FLOWW’s objectives are to discuss effectively on issues arising from the interaction of the fishing industry and offshore renewables activity, share and develop best practice, and liaise with other sectors with interests in the marine environment.” Concerning the structure of the organization, it “comprises approximately 40 organizations with an interest in offshore renewables and the fishing industry, and are drawn from fishing industry bodies and representatives from developers, government and The Crown Estate”, which provides the secretariat services of the group. In addition, FLOWW meets quarterly per year.⁹⁰

⁹⁰ Retrieved on August 23, 2022 from the official website page for the Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW).
<https://www.thecrownestate.co.uk/en-gb/what-we-do/on-the-seabed/our-partnerships/the-fishing-liaison-with-offshore-wind-and-wet-renewables-group/>

A try-and-error process has since begun. Throughout four rounds of the offshore wind projects the Crown Estate has released, Round 2 especially encountered suspicion and even opposition from the local community. In Round 2, the negotiation process with the stakeholders only took one month; additionally, most of the areas of the seabed were decided by the developer. Hence, to local fishing operators, little information was provided during the preliminary phase and environmental impact assessment. Not merely the lack of public participatory channels and reliable data, but also the fact that offshore wind energy itself was much more supported by the government, environmental protection groups and therefore the opinions of the general public would make the local fishing operators more disadvantaged and powerless during the process of negotiations. In response, the UK passed in 2004 the Environmental Assessment of Plans & Programmes Regulations and established a practical and comprehensive system of stakeholder participation within the policy environmental impact assessment. Unlike Round 2, stakeholders in Round 3 were encouraged to participate preliminarily in zone appraisal and planning and in decision-making in the process of regional development. (張睿寧, 2021, pp. 157-158).

What's more, the central and local governments partnered with local economic partnerships (LEPs) and established the Centres for Offshore Renewable Engineering (COREs) that “ensure businesses looking to invest in manufacturing for the offshore renewables industry receive the most comprehensive support possible”. The COREs aim “to attract major manufacturers of offshore renewable energy equipment by explaining national and local incentives.”⁹¹ The RenewableUK, formerly known as the British Wind Energy Association (BWEA), has also sponsored the public communications mechanisms through the COREs and set up several plans

⁹¹ Retrieved on August 25 from the official website of the UK government:
https://www.gov.uk/government/publications/centres-for-offshore-renewable-engineering?fbclid=IwAR0GIowbJsrVFMgapyL_Fr-2-IFTnVmdim8e8SNyAmzHudp6vxNqg7q67AE

starting 2013. The UK government also launched an offshore wind energy supply chain build-up project called GROW: Offshore Wind; it funded up to 20 million pounds as regional development funds and initiated a manufacturing consulting service. With the COREs, cooperated with local governments, responsible for six major areas of offshore wind farms, five low carbon enterprise zones were set up for the implementation of tax exemption, local customers services, deregulation and infrastructure construction. Furthermore, the UK Trade and Investment (UKTI) signed Memorandum of Understanding (MOU) with all of the local economic partnerships, and cooperated with COREs and enterprise zones in attracting and supporting potential investors for their inquiries and needs at the local level. (徐昕煒, 2014, pp. 121-122).

Chapter 4: Policy Analysis



From the establishment of the UNFCCC regime to the ratification of the Paris Agreement, the ratio of renewable energy to the total pie of global power generation has been soaring up as countless countries have pledged to reach carbon net zero by around the former half of this century. Transitions in power supply as a public policy have since played a significant role in which environmental protection and sustainable development have emerged as essential topics of global and local governance. Amongst all sorts of energy supply, wind power, especially offshore wind power, may top the list of development scale upon its potential reserves and the recent technological progress in the industry in recent years.

The thesis compares and analyzes offshore wind energy policies in Taiwan and the United Kingdom and how they developed the issues and challenges. In the discussion of previous chapters, the thesis broke them down into four dimensions: policy preferences and political attitudes, national capacity, governance, and the conflict of rights. In policy preferences and political attitudes, the two major offshore markets are being regulated by different governments with different preferences and reasons in encouraging or discouraging offshore wind energy development. Those preferences, with political attitudes the public opinions leaned upon, are related to two marginal conditions: national capacity and governance. National capacity signifies

the level of offshore wind technological development in which the two major players, Taiwan and the UK, are at different situations and may have experienced different paths. The condition of governance tells us the status and ways of how they approached the issues—political or social—and how the political institutions and structures affected them and their decision-making. The three dimensions mentioned above constituted the conflict of rights, which is the fourth dimension. The conflict of rights addressed the crucial problem from which Taiwan and the UK has or had been suffering. In this chapter, the thesis tries to identify the points of issue and appropriate reasonings of them, and find a way out for those unsolved.

A An Overview

Taiwan, as a latecomer in global decarbonization, has prioritized renewable energy transitions in its domestic political agenda since the early 2010s. In 2017, Taiwanese government promulgated a 4-year plan of wind energy development⁹² in which offshore wind energy was promoted in 3 phases and planned to reach 3 GW in capacity by 2025 from zero in 2015. (經濟部能源局, 2017, pp. 1-4). The policy goal was raised to 5.7 GW with the discovery that in the Taiwan Strait lies many of the top 20 sites for offshore wind speed⁹³. As Taiwan speeded up its pace in the race of global energy transitions, conflicts and concerns on energy democracy were observed. Aside from debates on environmental impacts, a lot of protests and political tension

⁹² The Four-year Wind Power Promotion Plan (translated from its original name in Taiwanese Mandarin: 風力發電4年推動計畫) is a governmental project to practically encourage wind energy development in Taiwan. It is also an early-stage industrial policy for Taiwanese offshore wind development; see 行政院 (2017).

⁹³ Department of Information Services, Executive Yuan (Executive Yuan in Taiwanese Mandarin: 行政院, a government branch of Taiwan equivalent to the Cabinet). (2019, June 13). *Offshore Wind Power Generation*.


<https://english.ey.gov.tw/News3/9E5540D592A5FECD/34ff3d6b-412e-458d-afe9-01737d2da52d>

have been ratcheted up on the interruptions to local families and communities from their livelihoods–fisheries, in particular. In consequence, development projects often encounter postponement and difficulties over the stand-off between the local people and developers. (張睿寧, 2021, pp. 2-8). Severe socio-economic confrontations resulted in political conundrums, causing a lose-lose situation among stakeholders, including but not limited to the government, developers, and local fishery operators. As a result, despite the governmental attempts and efforts to develop an industrial cluster and build up a supply chain through offshore wind development policies⁹⁴, the public backlash at the local level may hinder the progress and damage the policy outcomes.

In comparison, the United Kingdom, as a global leader in renewable energy, tells a successful story of offshore wind development. (Lee & Zhao, 2021, p. 26). It continued to top the list of cumulative offshore wind capacity by country as of the end of 2020. (Lee & Zhao, 2021, p. 21). It is not only taking the lead in offshore wind turbine deployment but also keen at national capacity building. Instead of being dependent on public subsidies, the British offshore wind sector has been able to provide electricity at a price lower than that of fossil fuel-driven power generation. To catalyze industrial commercialization and growth at the right time, it successfully established “a stable but progressive and adaptable policy regime”, encouraging innovation and supporting the market. (Jennings *et al.*, 2020, p. 11). Along with its substantive actions, the UK is also among the first major economies in the world that pledged to reach carbon net-zero by 2050. (HM Government, 2021, p. 39). However, the United Kingdom was once considered a passive player with poor performance in the field in the early years⁹⁵. (Toke, 2011, p. 527). When

⁹⁴ 行政院. (2019).〈全力推動離岸風電—打造台灣成為亞洲離岸風電技術產業聚落〉. <https://www.ey.gov.tw/Page/5A8A0CB5B41DA11E/9eebb9b8-490b-4357-963f-a48a981852a7>

⁹⁵ Also see Mitchell & Connor (2004) and Mitchell *et al.* (2006).



Demark put into operation the very first offshore wind farm in the world in 1991 (Rock & Parsons, 2010, p. 2), the UK came late with the policy of Renewable Obligations that was criticized for providing too little long-term financial security and incentives for business investment. In response, the British government has conducted a wide array of policy innovation. (Toke, 2011, pp. 527-528). Its first offshore wind farm⁹⁶ eventually set out off the coast of Blyth in North East England in 2000. (Crabtree *et al.*, 2015, p. 728). Since then, the UK has managed to scale up both its domestic market and international export by building up a comprehensive offshore wind technology cluster and industrial supply chain. (Offshore Wind Industry Council, 2018, pp. 10-18). Its recent Offshore Wind Sector Deal. (HM Government, 2019) and following policies have struck the industry with major economic outcomes. (Allen *et al.*, 2021, p. 888). In addition, great potential in electricity exporting in the future has been revealed as the offshore wind capacity keeps soaring up. (Jansen *et al.*, 2022, p. 12).

B Similar Preferences, Different Governance

Taiwan and the UK have similar policy preferences in energy transitions, and thus similar political attitudes in developing offshore wind energy. Both of them are committed to carbon reduction. Both of them pledged to transform the energy structure to renewables. Both of them endeavored to construct offshore wind farms at a rapid pace. Both of them aimed to build up a domestic supply chain with industrial clusters. The two major offshore wind markets in the world have been actively leasing their sea area for wind farm construction, aside from the fact that the political motives in which the policy goals of energy transitions were made seem

⁹⁶ The Blyth Offshore Wind Farm, the UK's first offshore wind farm, was a small-scale offshore wind farm approximately 0.6 mile (1 km) off the coast of Blyth, Northumberland, (North East) England. *see* Wilson (2007), p. 9.

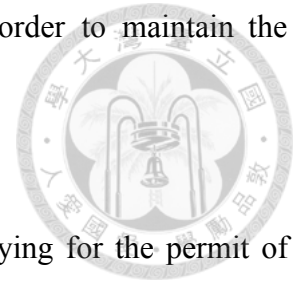
different: Taiwan prioritized the goal of a nuclear-free homeland while the UK pledged to reach coal-free by 2035 and net zero by 2050.



However, in temporal terms, the UK went ahead of Taiwan for approximately a decade when it comes to offshore wind development. Offshore wind development as a highly complicated policy structure involves a complex of public policy construction that often requires long-term experience accumulation and knowledge build-up, and demands political communications and consensus with the public and stakeholders when it comes to policy implementation. Into the bargain, implementing such a grand structure of policies also entails a highly sophisticated process of political and administrative coordination between government agencies and within the government, and that is a lot of work which also takes time and experience.

The UK values not only democratic processes but also governance efficiency. The consenting process prior to the acquisition of the development right ensures the local communities' and stakeholders' participation into the decision-making process. The Crown Estate as a competent authority to development activities at British seas and the BEIS as a policy-making agency and assessment authority to the offshore wind energy industry have a clear division of labor which ensures efficiency during the application process. Various government-sponsored organizations also have diverse memberships that include local representatives, representatives from relevant industries such as fisheries, shipping and energy providers, and representatives from different levels of government. They are keen at public communications and enhance the democratic value within the process; while insisting inclusiveness through those organizations, the government

also set up organizations of specialty, the FLOWW, for example, in order to maintain the effectiveness and efficiency during the negotiations.



Compared to the UK, it is obvious in Taiwan that the red tape in applying for the permit of offshore wind farm development is obstructing the efficiency of the government and preventing them from achieving its goals of making a smooth transition toward renewable energy. Too many different procedures are going separately and independently; some may argue that keeping them independent can enable different agencies to proceed at the same time, thus saving time and making the whole process. However, it may have to achieve them at the cost of other issues that also require time, especially those that need public deliberation or democratic participation in order to reach political consensus, compromises, agreements, or consents. For instance, in Taiwan, the negotiation for fisheries compensation happens separately with the development project proposed and affirmed by the environmental impact assessment. The fishing operators are not guaranteed the status during the environmental impact assessment or public hearings in order to compensate themselves from the potential development. To those fishing operators in Taiwan, they are provided a yes-no question to the development project; the negotiations of fisheries compensation will only happen after they answer yes. It is more like a zero-sum situation rather than a friendly conversation.

C Similar Paths, Different Approaches

Both Taiwan and the UK started with goals in which they wanted to catch up with their international counterparts in offshore wind energy technologies and development. Both of them

started with the three-stage strategy when leasing the sea area to the developers. Both of them provided policy motivations in order to encourage the private sector's investment and participation into the industry, such as subsidies, feed-in tariffs, etc. However, they took strikingly different policy approaches as to achieving their policy goals: Taiwan was implementing industrial policies whereas the UK was implementing innovation policies.

In early 2013, the UK government proposed an array of innovation policies for the industry and improved market transparency and credibility, competitiveness and comprehensiveness of the supply chain, innovation strategies, financial accessibility, and professional training. On the other hand, most of the Taiwanese policies stopped at conventional ways of providing economic incentives such as tax reduction (feed-in tariffs) and price guarantees. In addition, the UK approach toward supply chain build-up and domestic manufacturing is merely an encouragement. (饒瑞正, 2021, pp. 255-256). It is the fruit of national innovations in offshore wind technologies and human resources. Taiwan, on the other hand, made it mandatory without providing sufficient support in innovation and even administration, while imposing all of the responsibilities upon the developers.

Plus, Taiwan and the United Kingdom are endowed with different levels of national capacity toward offshore wind technologies. While the UK had been struggling in catching up with their European counterparts, it managed to cultivate its own offshore wind industry and supply chain with later technological innovations in the field. On the contrary, Taiwan had zero offshore wind turbine installation until 2015. Considering the required technological level for offshore wind energy appears much higher than that for its onshore wind counterpart, it is extremely

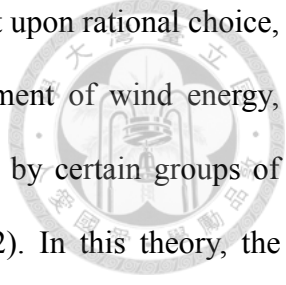
challenging that Taiwan could reach its goal on wind turbine installation by 2025 and establish a highly domesticized and self-sufficient supply chain for the offshore wind industry within such a short span of time.



In the business field, reliability is an important condition for market access. For instance, the UK leader in the construction of wind turbines in 1982, Howden Ltd., tried to enter the California market but withdrew from it two years later due to severe reliability issues. It eventually cost the company its whole wind turbine manufacturing department closed in 1989. (Graziano *et al.*, 2017, p. 716). Developers often prefer their partners in the supply chain with favorable business credibility, history and experiences since offshore wind development consists of various kinds of risks even greater than that of petroleum or natural gas. New market entry is thus required for high ability of innovation and cost reduction in order to win a contract. In addition, given that wind farm construction is a lot more complicated, small manufacturing contractors and component providers are usually burdened with higher responsibilities on risks. In consequence, UK manufacturers and providers that already succeeded in the domestic market often partnered and cooperated in order to enlarge their opportunities and access to the global market. (徐力平 & 林新華, 2019, p. 26).

D Explaining the Conflict of Rights

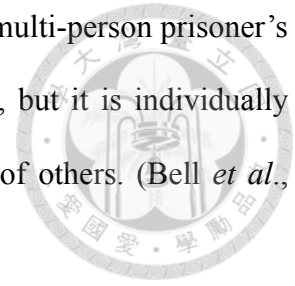
Opposition from local fishing operators against offshore wind farms happened in both Taiwan and the United Kingdom. Bell (2005) implemented three ideas in explaining the gap between the high rate of support from the general public and the low level of success at the local



communities. First of all, democratic deficit explains the phenomenon that upon rational choice, while general public opinions show the majority supports the development of wind energy, particular wind energy development projects are likely to be influenced by certain groups of people who oppose them. (Bell *et al.*, 2005, p. 461, citing Toke, 2002). In this theory, the opponents might reasonably “believe that actively opposing a development would make a significant enough contribution to their goal of protecting the local landscape to outweigh the costs of participation.” (Bell *et al.*, 2005, p. 462). “The structure of the planning system may encourage “oppositional” participation but planning policy and government support for wind energy may make successful opposition increasingly difficult.” (Bell *et al.*, 2005, p. 463, citing Toke, 2005).

Nextly, the qualified support explanation maintains the failure of wind developments reflects a general principle of “qualified support” for wind energy, and most people that support energy development projects do not support them without qualifications. People who are qualified supporters may tend to make “an exception to their general principle in certain cases in which they may be affected directly.” (Bell *et al.*, 2005, p. 464). This explanation echoes the concept of Not In My Backyard. Traditionally, the Not In My Backyard (NIMBY) effect describes a phenomenon in which a policy with strong features of public interests will be opposed by those who would be directly affected. For example, an environmental protection measure that would have to build an infrastructure in a certain neighborhood will be very likely to encounter protests by the members of this and also its nearby communities. This is partially as a result of the fact that the environmental or ecological costs of the policy have not been internalized and can be resolved in an institutionalized manner. The NIMBY is also connected to the last explanation:

self-interest. It is also based upon the assumption of rational choice. In a multi-person prisoner's dilemma it is "collectively rational for the public good to be produced", but it is individually rational for each individual to become a free-rider on the contributions of others. (Bell *et al.*, 2005, p. 465).



E The Privatization of Fish Resources

Traditional political institutions and regulatory regimes, in light of natural resources management, tend to rely upon representative democracy in decision-making and upon market-based mechanisms in regulations⁹⁷. (MacDonnell & Bates, 2010, p. 14). The creation of licensed property on fisheries is one of the archetypal examples in modern society. Such type of ownership is created by regulatory law and exists at the discretion of the public officials. (Raymond, 2003, pp. 16-17). Despite the fact that it is still a right established under the regulatory managerial mechanism, this market-based environmental policy has to some extent privatized the natural resources in a sociological sense.

F The Nature of Fishing Rights in Taiwan

Taiwan is a civil law jurisdiction with traditions of Japanese and German laws. It is necessary in search of the nature of the right from relevant theories stemming from its origin in order to know how it reflects the above-mentioned spirit in the public trust theory in modern Taiwanese society.

⁹⁷ Also see McHarg *et al.* (Eds.) (2010), pp. 413-418; Jacobs (1995); Moran (1995); 北村 喜宣 (2018), pp. 162-164; 葉俊榮 *et al.* (Eds.) (2020), pp. 471-472; and Anderson & Leal (2001).

In Yeh (2007)'s research, it is suggested that they belong to public property (öffentlichen Sachen) (葉進雄, 2007, pp. 158-159), and that such rights should be redefined as a sort of subjective public rights. (葉進雄, 2007, pp. 161-162). By its definition, the concept of public property refers to the property which is under administrative control in order for public use to achieve certain public purposes (陳敏, 2016, p. 1041); hence, according to Article 6 of the Fisheries Act, the public waters per se are public properties⁹⁸. In Roman law, which serves as the origin of civil law, such property is *res nullius* (nobody's thing) bound by the *res extra commercium* (the thing outside commerce) doctrine, which implies that the property cannot be held as private property or subject to transaction. (陳敏, 2016, p. 1043). In Taiwan, some natural resources resonate to the similar philosophy in law, such as water. For example, Article 2 of the Water Act reads, "water resources, being part of the natural resources, are owned by the state, and the state ownership is not prejudiced by the land ownership of any persons."⁹⁹

However, the legislator stipulated the fishing right as a right in rem, which is a special legislative arrangement different from the words used for the water usufruct; unlike what is regulated in the Water Act, the fishing right is privatized under the clause and should be regarded as a type of real property¹⁰⁰ instead of an usufruct. In the theory (陳敏, 2016, pp. 1044-1046) presented by Chen (2016)'s treatise on administrative law, a subject matter, while being public, retains its quality as a private property to a certain extent upon the constraint that serves the purpose of public

⁹⁸ Article 6 of the Fisheries Act, "Any person who intends to operate fishery in the public waters or non-public waters adjacent thereto shall obtain approval given and fishing license issued by the competent authority prior to the operation." Its original texts in Taiwanese Mandarin, "凡欲在公共水域及與公共水域相連之非公共水域經營漁業者, 應經主管機關核准並取得漁業證照後, 始得為之。"

⁹⁹ Its original texts in Taiwanese Mandarin, "水為天然資源, 屬於國家所有, 不因人民取得土地所有權而受影響。"

¹⁰⁰ Its quality as a property right is also exemplified by the fact that it is one of the items listed within Paragraph 1, Article 3 of the National Property Act (Taiwanese Mandarin: 國有財產法).

easement/servitude (öffentlich-rechtliche Dienstbarkeit); that is to say, the ownership remains effective as long as the private right performance does not damage its public purpose. In this sense, the regulation of seizing the fishing right that in effect results in complete economic wipeouts constitutes the expropriation equivalent to categorical takings. (陳敏, 2016, p. 1209). The Constitution of Taiwan¹⁰¹ established the institutional (Institutionsgarantie), individual (Individualgarantie) and existent (Bestandsgarantie) protection according to its Article 15¹⁰², and the property value (Eigentumwertgarantie) is guaranteed according to, inter alia, Judicial Yuan Interpretation No. 400¹⁰³. Thanks to the Interpretation, the right to claim for *just compensation* “from the government” has been protected at the constitutional law level¹⁰⁴ if the government takes private property for public use.

G The Role of Public Trust Theory in Policy-making

Of course, Taiwan is a jurisdiction adopting a civil law system without the public trust doctrine at law. Still, since the socialist nature of the legislation regarding the use of ocean resources, it embodies the fundamental spirit into the law while lacking others. Therefore, the thesis intends to revisit the modern public trust theory and examine how it could play a role in public policy

¹⁰¹ Its original name in Taiwanese Mandarin: 中華民國憲法.

¹⁰² Article 15 of the Constitution of Taiwan, “The right of existence, the right of work, and the right of property shall be guaranteed to the people.” Its original texts in Taiwanese Mandarin, “人民之生存權、工作權及財產權, 應予保障。”

¹⁰³ Judicial Yuan Interpretation (Taiwanese Mandarin: 司法院大法官解釋) is Taiwanese constitutional review published by the Justices of the Constitutional Court of Judicial Yuan (Taiwanese Mandarin: 司法院大法官).

¹⁰⁴ Judicial Yuan Interpretation No. 400 (Taiwanese Mandarin: 司法院大法官釋字第400號解釋) (concerning the case of Public Easements on and Taking of Privately-Owned Existing Roads) ruled, “To be consistent with this constitutional protection of the right to property, state authorities, for the necessity of public use or other public interests, may take an individual’s property according to law, but shall make just compensation in return...”

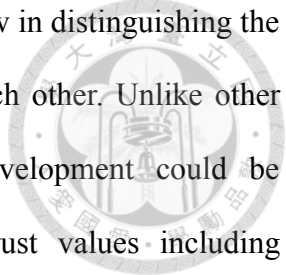
making. By doing so, the problem inside Taiwanese legal system regarding national resource regulations that led to the conflict of rights among the fisheries and offshore wind farm developers is expected to be improved with an institutional reinvention.



Klass (2006) posited that public trust doctrine and active environmental legislation are not an “either-or dichotomy” proposition. (Klass, 2006, p. 754). As the latter serves the development of innovative public trust principles with policy directions and standards, the former furnishes the vehicle for judicial review when the statute does not provide its own right of action. In the era with significant public concern about the failure of the executive and legislative branches, the doctrine helps substantiate the attempts to fill the void. (Klass, 2006, pp. 748-750). Klass (2012) also argued that, as emerging issues concerning climate change and sustainable development overwhelm the political agenda, “both proponents and opponents” of the renewable energy projects have “looked to the public trust doctrine to advance their goals”. (Klass, 2012, p. 1021). In the past, the superiority of environmental protection and natural preservation may outweigh the energy development under the traditional sense of the public trust doctrine—whatever types of energy would all be categorized as exploitation. However, in the 21st century, they become competing public trust values balanced between environmental sustainability and energy sustainability. For example, the Cape Wind Project¹⁰⁵ built near the shore of Massachusetts is the most famous case regarding offshore wind energy development and public trust doctrine epitomized by the case of *Moot v. Department of Environmental Protection (2007)*¹⁰⁶.

¹⁰⁵ see *Alliance to Protect Nantucket Sound, Inc. v. Energy Facilities Siting Board (Alliance I)*, 858 N.E. 2d 294 (Mass. 2006); and also *Alliance to Protect Nantucket Sound, Inc. v. Energy Facilities Siting Board (Alliance II)*, 932 N.E. 2d 787 (Mass. 2010).

¹⁰⁶ *Moot v. Department of Environmental Protection*, 861 N.E. 2d 410 (Mass. 2007).



Subsequently, the purpose of usage emerged as critical criteria in equity law in distinguishing the priority of respective usufructs under the doctrine as they contradict each other. Unlike other projects in the past, Klass (2012) described, renewable energy development could be distinguishable since it has “a goal of promoting several public trust values including environmental values” under the context of climate change, especially those that benefit the future generations. When development becomes a means in order for protection and preservation, while in a manner of exploitation, its role in balancing public interests under the doctrine needs to be reconsidered. On one hand, the fact that large-scale renewable energy development projects cast great influence on climate change mitigation and adaptation is indispensable; on the other hand, such projects may nonetheless result in inappropriate use of land and waters. In addition, Klass (2012) also claimed that recent discussions over the public trust doctrine concentrated “squarely on the trust obligation toward future generations even more” than those toward the present ones. (Klass, 2012, pp. 1064-1065).

Graham and Wirth (2010) discussed the *Mono Lake* case and held that it expanded the scope of the doctrine to a higher standard on the government’s decision-making in addition to the traditional uses by adopting recreational and ecological objectives. (Graham & Wirth, 2010, pp. 870-878). Furthermore, Blumm (2010) described public trust doctrine as a accommodation principle with mediating function between “private property and public concerns through continuous state supervision of trust resources” (Blumm, 2010, p. 650) while noting the *Mono Lake* case; the doctrine is to moderate development rights as a background principle which is reflecting the spirit embedded in the case of *Lucas v. South Carolina Coastal Council* (1992), which also held that the deprivation of all economically viable use of property must be justly

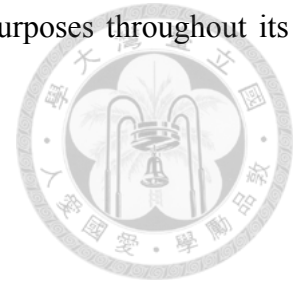
compensated¹⁰⁷. (Blumm, 2010, pp. 652-653). What's more, public trust doctrine actually allows certain privatization of public trust assets as long as "the public purposes" underlying the doctrine are "maintained" by referring to the distinguishing *Illinois Central Railroad Company* case¹⁰⁸. The doctrine, commonly speaking, acts for public easement on private property in practice, and indicates the co-existence of the public and private uses. (Blumm, 2010, pp. 660-663). Thus, instead of "an anti-privatization concept", it serves as "a vehicle for mediating between public and private rights in important natural resources". (Blumm, 2010, p. 666).

Since climate change in the 21st century comes up as one of the most crucial events in human history, energy transitions and sustainable development develop into a competent public trust right under the doctrine for its own sake. With statistical evidence, the doctrine has been taking a more active role in court while new socio-political and environmental sustainability issues spawned because of climate change and global warming. Sun (2011) has contrived a socio-political theory concerning the application of public trust doctrine in order to cope with the intricate trade-off between those competing public trust values. (Sun, 2011, p. 578). The research has stressed the fact that the public trust rights reflect the collective interests and conferred upon individuals who are members of the society; and the doctrine has been translated into a principle throughout its practices. Into the bargain, such a principle is crucial not merely in striking the balance, but also in achieving the co-existence of those values. As a consequence, public trust doctrine appears with flexibility in balancing private and public interests as a background principle of property law. Originating from the rule to restrict fee simple absolute for use for public interests, the doctrine has expanded its potential for innovation in promoting the

¹⁰⁷ Also see *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992).

¹⁰⁸ *Illinois Central Railroad Company v. Illinois*, 146 U.S. 387 (1892).

co-existence of interests of private property rights and use of public purposes throughout its interactions with regulatory law and jurisprudence.



H Potential Public Policy Agendas

In Taiwan, prior scholarship and research has long been focusing on surveying and analyzing the attitude and rate of acceptance of the local communities and stakeholders. Chen, Liu and Chaung (2015) adopted the social marketing approach with segmentation techniques into their survey. In its result, three segments of stakeholders are identified: (1) the impact-attend, (2) the comprehensive, and (3) the benefit-attend groups. According to their conclusion, effective policy communication strategies and participation of the stakeholders serve the key to strengthen the perception of benefits and therefore reduce the conflict. Chen, Liu, Chaung and Lu (2015) revisited the method of principal component analysis (PCA) and logistic regression models which were applied into the study for the assessment and analysis over the question of whether the perception factor of stakeholders turns out to be as influential as expected on their attitudes. As results of their survey were found positive, they concluded their findings with several policy recommendations, including offering benefits to the local communities and ocean users.

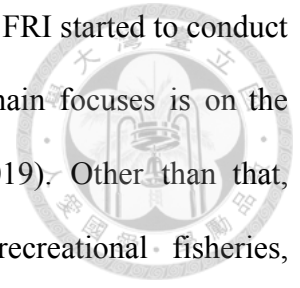
European and American scholars' concentrations, methodologies and ways of reasoning appeared to be much more different from those of the Taiwanese. Most of their research focuses on topics related to sustainability, co-existence and the co-location. Yates, Schoeman and Klein (2015) surveyed the feasibility to adopt the approach of ocean zoning and marine spatial planning so as to resolve the conflict between the interest of the fishing industry and the

development of marine renewable energy (MRE), as well as the conservation of (potential) endangered species. In their research, the non-linear trade-offs among industries and sectors have been found. The result signifies the increasing opportunities in achieving co-existence. In addition, by slating marine protected areas (MRAs) and incorporating the fishing activities into renewable energy construction sites, the co-location strategy could realize substantial reduction of costs to the energy industry during the development, avoid potential conflict and achieve the goals of conservation.

Campbell, Stehfest, Votier and Hall-Spencer (2014) suggested the application of the vessel monitoring system (VMS) in mapping technology to marine spatial planning (MSP) materializes the means in configuration of the MRAs and therefore contributes to the realization of the co-location. De Groot, Campbell, Ashley and Rodwell (2014) proposed an agenda of mitigation toward the fishing effort displacement was designed in resolving the obstacles against the co-existence with the support of scientific research in the approach of thematic analysis on the main challenges faced with those groups of stakeholders. Moreover, the research also identified three priorities for the agenda: the build-up of (1) efficient and (2) cost-effective mechanisms to overcome the data issues for assessment of the displacement, and the establishment of (3) an acceptable consultation protocol between the MRE and fisheries sectors.

As Taiwan was learning from the UK how to promote and implement offshore wind development policies, Taiwan is now keeping up with it in terms of pursuing co-existence and co-location. For instance, the Fisheries Research Institute (FRI) under the Council of Agriculture, Executive Yuan is researching the feasibility of a co-existence model in which the

transformed fisheries and offshore wind farms can co-locate. In 2018, the FRI started to conduct scientific research with bottom trawling experiments, and one of the main focuses is on the potential of seaweed aquaculture. (行政院農業委員會水產試驗所, 2019). Other than that, transforming the fishing industry, industrial upgrade, developing recreational fisheries, facilitating local employment through offshore wind farm tourism, and so many other kinds of solutions that could be applied to the co-location technologies are also awaiting for exploration.



Chapter 5: Conclusion



A In the Name of Sustainable Development

As history evolves, from an anthropological perspective, fossil fuels, from the industrial revolution in the 18th century to the age of globalization since the late 20th century, have been supporting the world population and their daily lives as one of the most powerful engines for modern human civilization. (Smil, 2017, p. 295). However, as science has proven that global climate change resulted, at least majorly, from anthropogenic activities due to the intense and excessive use of fossil fuel as the primary source of the energy supply, enormous actions and measures of mitigation and adaptation have been adopted by states and organizations in face of the challenges brought about by global climate change. One of, and probably the most essential part of them is energy transitions. Energy transitions consist of private and public sectors; however, in the context of sustainable development, the role of public policy is highlighted.

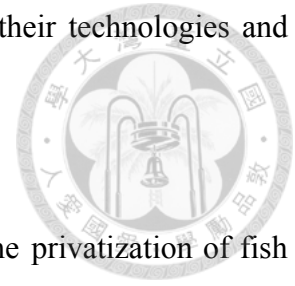
The prevalent public discourse tends to underscore one side of the coin when it refers to sustainable development: the side that is for sustainability and the public interests. However, the question is: who is exactly the public? The answer depends upon occasions, and it gives rise to an opportunistic basis for political narratives. As a result, there is someone left behind. Those

who would be largely affected by climate change through the policy for its mitigation and adaptation suffer ignorance and injustice when sustainable development is justified by the society as one of the most necessary public policy doctrines to achieve those goals. For a long time, sustainable development in its own political discourse represents intergenerational equity and justice. However, this is often mistakenly interpreted by many. Sustainable development is indeed embedded with the meaning of intergenerational equity, but that is because of the part of sustainability, not that of development.

B Taiwan Compared to the United Kingdom

By comparing Taiwan and the United Kingdom, the research found that they actually shared a common ground in their motivations on policy formulation. They, for instance, both shared the same policy goals in advancing the industry's technological innovations within domestic jurisdictions; they also both adopted policies and measures in order to promote domestic manufacturing and supply chain buildups. However, they differ from each other not only in their background endowments but also in their policy approaches. The UK adopted innovation policies toward the offshore wind technologies and supported the industry in an active role by reducing financial risks, mediating the developers and local representatives, promoting technical cooperation between developers and research institutions, etc. Taiwan, on the contrary, implemented traditional industrial policies. While the policies themselves provided economic incentives for the developers, government officials actually played passive roles and merely waited for their applications. In addition, they also differed from their mindsets with regard to innovation: as the UK encouraged scientific research and development in offshore wind

technologies, Taiwan mandated their foreign-based developers transfer their technologies and skills to domestic manufacturers for market entries.



They also shared similar paths. Both Taiwan and the UK experienced the privatization of fish resources in sociological terms. In Taiwan, it is reflected upon the issue in which the fishing right is regarded as a property right (a right in rem); in the UK, the public policy in fish resource management through regulations, licenses, and marine policy plannings evolved into the concept of licensed property. When it comes to offshore wind farm construction that overlaps with traditional fisheries, oppositions from local fishing operators and communities are almost inevitable. In fact, both Taiwan and the UK underwent the problem. However, they diverged from each other in their logics of policy implementation with different opinions toward the opposition from the local public, and therefore led to different results in their responses to local affairs and the potential social issues. They exemplified two distinct types of governance: Taiwan leans on a more power-centralized and instructive governance that features the legacy from the authoritarian history, while the UK is characterized with a more decentralized and communicative type of governance along with its world-unique public-private relationships with the devolved governments. The government was a coordinator in the UK, while its counterpart in Taiwan was more like a bureaucracy.

As a consequence, the UK managed to bridge the social gap and entered into cooperative relationships among the governments, private sectors and local communities; on the other hand, Taiwan is still suffering the problem on account of reluctant government agencies and lack of an institution as a means of dispute resolution.

C The Role of Public Trust in Taiwan



In the development of offshore wind energy, there is an obvious conflict among different public interests and individual rights. The conflict between renewable energy development out of the public demand for energy transitions and the access to the critical natural resources in preservation of families, communities and traditional cultures epitomizes the significance in finding an innovative policy framework toward the (re-)allocation and (re-)arrangement of such resources for the purpose of co-existence. In order to protect individuals from the destruction of their essential ways of life and uphold the majoritarian-recognized public interests at the same time, the thesis suggests that an overhaul to the current regulatory regime of public resources management needs to be taken into action, and holds that the public trust as a consideration to sustainability is a missing piece in the legal policy where it would help bridge the gap between the regulatory state and society.

The conflict of rights happening here should be balanced with the principle of proportionateness under the basic condition in which people should be able to require the best available technologies (BATs) to be implemented in order to ensure the protection and execution of their right upon the concept of public trust—the access to the resources for the current and future generations (Baur *et al.*, 2008, p. 56). Upon the fact that Taiwan’s fisheries regulations are already embedded with the ideological foundation of the concept of public trust, Taiwan should incorporate the consideration to sustainability and protect the right of the future generations,

which is also one of the major requests of the fishing operators in Taiwan¹⁰⁹, under the construction of law. In practice, the prospect of the co-location technologies that has been applied to many countries in the world is one of the prominent examples that can be learned by the Taiwanese government. By recognizing the consideration, it can not only institutionalize the means of dispute resolution, but also internalize the government's active responsibility as a coordinator—just like what the UK has done for its people—during the process of development.

In fact, this public trust consideration has already been reflected in many of the laws enacted in Taiwan. For instance, the Basic Environment Act (Taiwanese Mandarin: 環境基本法) that was passed back in 2002 has already mentioned in Article 1 that the state shall pursue sustainable development¹¹⁰ and defined in Article 2 sustainable development as “satisfying contemporary needs without sacrificing the ability of future generations to satisfy their needs.”¹¹¹ The Act is a basic law of the environment in Taiwan and its provisions are supposed to be referred to as foundational principles of Taiwanese environmental regulations. The court of law in their jurisprudence should in the dispute interpret the law accordingly, and government agencies are obliged to take into consideration them when they are implementing policies.

In addition, as the coordination of offshore wind energy development, fisheries, and also other kinds of activities involves complicated utilization of of coastal areas and requires co-existence, the public trust consideration is also expressed in the Coastal Zone Management Act (Taiwanese Mandarin: 海岸管理法). To be specific, it mentioned sustainable development in its Article 1¹¹²

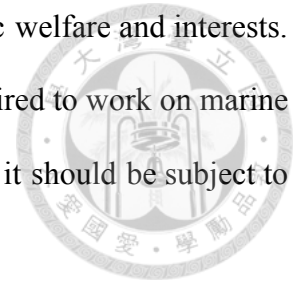
¹⁰⁹ See 張睿寧 (2021).

¹¹⁰ According to Article 1 of the Basic Environment Act.

¹¹¹ According to Article 2 of the Basic Environment Act.

¹¹² According to Article 1 of the Coastal Zone Management Act.

that is to balance different coastal activities in pursuit of optimized public welfare and interests. Following this Act that is in itself binding, the government should be required to work on marine spatial planning (MSP) and fulfill the requirement of co-existence¹¹³, and it should be subject to public scrutiny and demand by the court of law.



Therefore, Taiwan, by applying the spirit of public trust combined with the already-existing legal principles, should be able to learn from the UK experience and reinvent the policy undertakings. For example, the government should take on its own responsibility on fisheries compensation and answer the fishing operators' call for future co-existence, just as the UK government has been actively promoting development co-locations and transformations, and directly involved in the operation of fisheries liaison organizations and within the process of negotiations. In addition, local communities would be able to take part earlier in the decision-making process just as in the UK, local opinions were offered a seat in the pre-development negotiations. Otherwise, the government breaches its obligation as the trustee to manage and assure the public access to public trust resources in the present and future, and violates the sustainable development provisions under the Act mentioned above.

D The Future with the Local Community

The conventional cost-benefit analysis of economic values seems unable to comprehend the cry for a novel natural resources managerial system (MacDonnell & Bates, 2010, pp. 53-73); even from an anthropocentric viewpoint, utilities serve as an important but not the only consideration

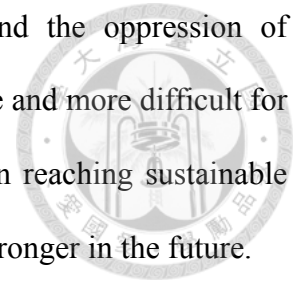
¹¹³ According to Article 7 of the Coastal Zone Management Act.

in which what counts as and how to improve human well-being or concern are still being contested. (MacDonnell & Bates, 2010, pp. 43-45). As market forces often do little to lessen core questions in this regard, the demand for a wide array of arrangements at various spatial levels necessitate local governance in the conglomerate of collective governance that also amalgamates the public and private, mixing and coordinating multiple activities and actors in a shared landscape. (MacDonnell & Bates, 2010, pp. 98-100).

From an anthropological viewpoint, local-level or special-interest managerial mechanisms are compatible or even applicable with the doctrine. (Milton, 1993, p. 92). On top of that, with respect to the research question, technological complications (葉俊榮, 1997a, pp. 33-34) and solutions in which innovation is given birth to by its progress are in need of an inclusive policy platform and legitimization process at different governance levels with different concerns. Considering feasible methods, the community-based approach should be taken into account along with the application of deliberative democracy when it comes to the problem of local representation within a democratic institution. The approach is not a contender against the market-based one; it is merely in search of a new policy discourse in resolving the top-down versus bottom-up approach dilemma. (Hale & Roger, 2014). It's a paradigm shift in public governance—not policy, which embraces the multi-governance model and embodies the integration of different policy tools.

In conclusion, this research attempts to further the understanding of the law and policy in public resources management under the context of sustainable development and promote a just and fair energy transitioning regime under a new governance structure. In Taiwan, so many development

and environmental-related issues ended up with political conflicts and the oppression of majoritarian rule. In the name of sustainable development, it will be more and more difficult for the minority to voice out for their own needs since the public interest in reaching sustainable development goals is further stronger than ever and would be even more stronger in the future.



The thesis recognizes the urgent call for a more and more sustainable society since climate change has become an emergency for the whole human civilization; however, another call for a just and fair society should not be forgotten since it is the very foundation of human civilization itself. In this sense, the government bears two identities simultaneously—representative of the public interest and the trustee of the public trust. The thesis hopes to suggest a way out between the balance through the example of the conflict between the fisheries and offshore wind development in Taiwan. By learning from the UK’s success story, Taiwanese government should be able to take on the responsibility and answer the calls.

Bibliography

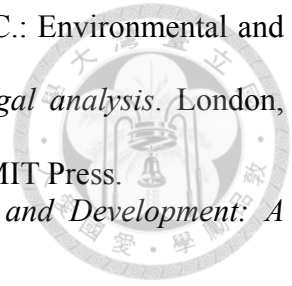


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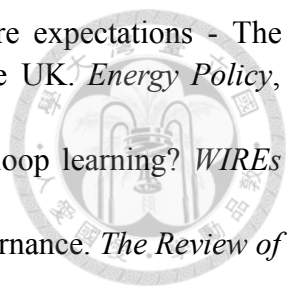
- Anderson, T. L., & Leal, D. R. (2001). *Free market environmentalism*. London, England: Palgrave.
- Baur, D. C., Eichenberg, T., & Sutton, M. (Eds.). (2008). *Ocean and coastal law and policy*. Chicago, IL: American Bar Association.
- Breyer, S., Stewart, R., Sunstein, C., & Spitzer, M. L. (2002). *Administrative law and regulatory policy: Problems, text, and cases* (5th edition). New York, NY: Aspen Publishers.
- Cohen, J. (1997). Deliberation and democratic legitimacy. In William Rehg & James Bohman (Eds.), *Deliberative democracy: Essays on reason and politics* (pp. 67-91). Cambridge, MA: The MIT Press.
- Graham, P. A., & Wirth, H. H. (2010). *Environmental law and policy: Nature, law and society*, 4th edition. New York, New York: Aspen Publishers.
- Hubbard, P. (2009). NIMBY. In Rob Kitchin & Nigel Thrift (Eds.), *International Encyclopedia of Human Geography* (pp. 444-449). Amsterdam, Netherlands: Elsevier.
- Jacobs, M. (1995). Sustainability and the market: A typology of environmental economics. In Robyn Eckersley (Eds.), *Markets, the state, and the environment* (pp. 47-69). Melbourne, Australia: Macmillan.
- Jennings, T., Tipper, H. A., Daghish, J., Grubb, M., & Drummond, P. (2020). *Policy, innovation and cost reduction in UK offshore wind*. London, England: The Carbon Trust.
- Kuhn, T. S. (1962). *The structure of scientific revolutions*. Chicago, IL: University of Chicago Press.
- Lee, J., & Zhao, F. (2021). *Global offshore wind report 2021*. Brussels, Belgium: Global Wind Energy Council.
- MacDonnell, L. J., & Bates, S. F. (Eds.). (2010). *The evolution of natural resources law and policy*. Chicago, IL: American Bar Association.
- McHarg, A., Barton, B., Bradbrook, A., & Godden, L. (Eds.). (2010). *Property and the law in energy and natural resources*. Oxford, England: Oxford University Press.
- Milton, K. (Eds.). (1993). *Environmentalism: The view from anthropology*. Abingdon, England: Routledge.
- Moran, A. (1995). Tools of environmental policy: Market instruments versus command-and-control. In Robyn Eckersley (Eds.), *Markets, the state, and the environment* (pp. 73-85). Melbourne, Australia: Macmillan.
- Percival, R. V., Schroeder, C. H., Miller, A. S., & Leape, J. P. (2009). *Environmental regulation: Law, science, and policy* (6th edition). New York, NY: Aspen Publishers.
- Plater, Z. J.B., Abrams, R. H., Graham, R. L., Heinzerling, L., Wirth, D. A., & Hall, N. D. (2010). *Environmental law and policy: Nature, law, and society* (4th edition). New York, NY: Aspen Publishers.
- Raymond, L. (2003). *Private rights in public resources*. Washington, D.C.: Resources for the Future.


- Rock, M., & Parsons, L. (2010). *Offshore wind energy*. Washington, D.C.: Environmental and Energy Study Institute.
- Stallworthy, M. (2002). *Sustainability, land use and environment: A legal analysis*. London, England: Cavendish Publishing Limited.
- Smil, V. (2017). *Energy and civilization: A history*. Cambridge, MA: The MIT Press.
- Viñuales, J. E. (Eds.). (2015). *The Rio Declaration on Environment and Development: A commentary*. Oxford, England: Oxford University Press.



Periodicals

- Allen, G., Connolly, K., McGregor, P., Ross, A. G. (2021). A new method to estimate the economic activity supported by offshore wind: A hypothetical extraction study for the United Kingdom. *Wind Energy*, 24, 887–900.
- Batt, J., & Short, D. C. (1993). The jurisprudence of the 1992 Rio Declaration on Environment and Development: A law, science, and policy explication of certain aspects of the United Nations Conference on Environment and Development. *Journal of Natural Resources & Environmental Law*, 8(2), 229-292.
- Bell, D, Gray, T., & Haggett, C. (2005). The ‘social gap’ in wind farm siting decisions: Explanations and policy responses. *Environmental Politics*, 14(4), 460-477.
- Blumm, M. C. (2010). The public trust doctrine and private property: The accommodation principle. *Pace Environmental Law Review*, 27(3), 649-667.
- Campbell, M. S., Stehfest, K. M., Votier, S. C., & Hall-Spencer, J. M. (2014). Mapping fisheries for marine spatial planning: Gear-specific Vessel Monitoring System (VMS), marine conservation and offshore renewable energy. *Marine Policy*, 45, 293-300.
- Carr-Harris, A., & Lang, C. (2019). Sustainability and tourism: The effect of the United States first offshore wind farm on the vacation rental market. *Resource and Energy Economics*, 57, 51-67.
- Chen, J., Liu, H., & Chaung, C. (2015). Strategic planning to reduce conflicts for offshore wind development in Taiwan: A social marketing perspective. *Marine Pollution Bulletin*, 99, 195-206.
- Chen, J., Liu, H., Chaung, C., & Lu, H. (2015). The factors affecting stakeholders’ acceptance of offshore wind farms along the western coast of Taiwan: Evidence from stakeholders’ perceptions. *Ocean & Coastal Management*, 109, 40-50.
- Crabtree, C. J., Zappala, D., & Hogg, S. I. (2015). Wind energy: UK experiences and offshore operational challenges. *Journal of Power and Energy*, 229(7), 727–746.
- de Groot, J., Campbell, M., Ashley, M., & Rodwell, L. (2014). Investigating the co-existence of fisheries and offshore renewable energy in the UK: Identifications of a mitigation agenda for fishing effort displacement. *Ocean & Coastal Management*, 102, 7-18.
- Frank, R. M. (2012). The public trust doctrine: Assessing its recent past & charting its future. *UC Davis Law Review*, 45, 665-691.

- 
- Graziano, M., Lecca, P., & Musso, M. (2017). Historic paths and future expectations - The macroeconomic impacts of the offshore wind technologies in the UK. *Energy Policy*, 108, 715-730.
- Gupta, J. (2016). Climate change governance history, future, and triple-loop learning? *WIREs Climate Change*, 7(2), 192-210.
- Hale, T., & Roger, C. (2014). Orchestration and transnational climate governance. *The Review of International Organizations*, 9, 59–82.
- Jansen, M., Duffy, C., Green, T. C., & Staffell, I. (2022). Island in the sea: The prospects and impacts of an offshore wind power hub in the North Sea. *Advances in Applied Energy*, 6(100090), 1-14.
- Kern, F., Smith, A., Shaw, C., Raven, R., & Verhees, B. (2014). From laggard to leader: Explaining offshore wind developments in the UK. *Energy Policy*, 69, 635-646.
- Klass, A. B. (2006). Modern public trust principles: Recognizing rights and integrating standards. *Notre Dame Law Review*, 82, 699-754.
- Klass, A. B. (2012). Renewable energy and the public trust doctrine. *UC Davis Law Review*, 45(3), 1021-1074.
- Lazarus, R. J. (1986). Changing conceptions of property and sovereignty in natural resources law: Questioning the public trust doctrine. *Iowa Law Review*, 71, 631-716.
- Leary, D., & Esteban, M. (2009). Climate change and renewable energy from the ocean and tides: Calming the sea of regulatory uncertainty. *The International Journal of Marine and Coastal Law*, 24(4), 617-651.
- Merino, R. (2018). Re-politicizing participation or reframing environmental governance? Beyond indigenous' prior consultation and citizen participation. *World Development*, 111, 75-83.
- Mitchell, C., & Connor, P. (2004). Renewable energy policy in the UK 1990–2003. *Energy Policy*, 32(17), 1935–1947.
- Mitchell, C., Connor, P., & Bauknecht, D. (2006). Effectiveness through risk reduction: A comparison of the renewable obligation in England and Wales and the feed-in system in Germany. *Energy Policy*, 34(3), 297–305.
- Pappas, M. (2018). Disclaiming property. *Harvard Environmental Law Review*, 41, 391-451.
- Popovic, N. (1993). The right to participate in decisions that affect the environment. *Pace Environmental Law Review*, 10, 683–708.
- Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: In search of conceptual origins. *Sustainability Science*, 14 (3), 681–695.
- Sax, J. L. (1970). The public trust doctrine in natural resource law: Effective judicial intervention. *Michigan Law Review*, 68, 471-567.
- Sun, H. (2011). Toward a new social-political theory of the public trust doctrine. *Vermont Law Review*, 35(3), 563-622.
- Toke, D. (2002). Wind power in UK and Denmark: Can rational choice help explain different outcomes? *Environmental Politics*, 11, 83–100.

- 
- Toke, D. (2005) Explaining wind power planning outcomes – some findings from a study in England and Wales. *Energy Policy*, 33(12), 1527 – 1539.
- Toke, D. (2011). The UK offshore wind power programme: A sea-change in UK energy policy? *Energy Policy*, 39, 526-534.
- Vining, A. R., & Weimer, D. L. (2016). The challenges of fractionalized property rights in public-private hybrid organizations: The good, the bad, and the ugly. *Regulation & Governance*, 10(2), 161-178.
- Williams, C., & Millington, A. C. (2004). The diverse and contested meanings of sustainable development. *The Geographical Journal*, 170(2), 99-104.
- Wirth, D. A. (1995). The Rio Declaration on Environment and Development: Two steps forward and one back, or vice versa. *Georgia Law Review*, 29, 599-653.
- Yates, K., Schoeman, D. S., & Klein, C. J. (2015). Ocean zoning for conservation, fisheries and marine renewable energy: Assessing trade-offs and co-location opportunities. *Journal of Environmental Management*, 152, 201-209.

Laws and Court Decisions

- The United Kingdom of Great Britain and Northern Ireland. Electricity Act 1989, 1989 c. 29. (1989). <https://www.legislation.gov.uk/ukpga/1989/29/contents>
- The United Kingdom of Great Britain and Northern Ireland. Utilities Act 2000, 2000 c. 27. (2000). <https://www.legislation.gov.uk/ukpga/2000/27/contents>
- The United Kingdom of Great Britain and Northern Ireland. Energy Act 2004, 2004 c. 20. (2004). <https://www.legislation.gov.uk/ukpga/2004/20/contents>
- The United Kingdom of Great Britain and Northern Ireland. Climate Change Act 2008, 2008 c. 27. (2008). <https://www.legislation.gov.uk/ukpga/2008/27/contents>
- The United Kingdom of Great Britain and Northern Ireland. Marine and Coastal Access Act 2009, 2009 c. 23. (2009). <https://www.legislation.gov.uk/ukpga/2009/23/contents>
- The United Kingdom of Great Britain and Northern Ireland. Energy Act 2013, 2013 c. 32. (2013). <https://www.legislation.gov.uk/ukpga/2013/32/contents>
- The United Kingdom of Great Britain and Northern Ireland. Energy Act 2016, 2016 c. 20. (2016). <https://www.legislation.gov.uk/ukpga/2016/20/contents/enacted>
- The United Kingdom of Great Britain and Northern Ireland. The Climate Change Act 2008 (2050 Target Amendment) Order 2019, 2019 No. 1056. (2019). <https://www.legislation.gov.uk/uksi/2019/1056/contents/made>
- The Scottish Parliament. Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, 2019 asp 15. (2019). <https://www.legislation.gov.uk/asp/2019/15/enacted>
- United States of America. Clean Air Act, 42 U.S.C. §7401 et seq. (1990). <https://www.epa.gov/clean-air-act-overview/clean-air-act-text>
- United States of America. U.S. Const. amend. V. (1791). <https://constitution.congress.gov/constitution/amendment-5/>

United States of America. U.S. Const. amend. XIV. (1868).

<https://constitution.congress.gov/constitution/amendment-14/>

Arnold v. Mundy, 6 N.J.L. 1 (N.J. 1821).

Martin v. Waddell, 41 U.S. 367 (1842).

Illinois Central Railroad Company v. Illinois, 146 U.S. 387 (1892).

Shively v. Bowlby, 152 U.S. 1 (1894).

People v. Zankich, 20 Cal. App. 3d 971 (1971)

National Audubon Society v. Superior Court of Alpine County, 658 P.2d 709 (Cal. 1983).

Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992).

Ventura County Commercial Fishermen Association v. California Fish and Game Commission,
No. B166335, 2004 WL 293565 (Cal. App. 2d Feb. 17, 2004).

Alliance to Protect Nantucket Sound, Inc. v. Energy Facilities Siting Board, 858 N.E. 2d 294
(Mass. 2006).

Moot v. Department of Environmental Protection, 861 N.E. 2d 410 (Mass. 2007).

Alliance to Protect Nantucket Sound, Inc. v. Energy Facilities Siting Board, 932 N.E. 2d 787
(Mass. 2010).



International Legal Documents

Agenda 2030. (Transforming our world: the 2030 Agenda for Sustainable Development; Resolution Adopted by the General Assembly on 25 September 2015). A/RES/70/1. October 21, 2015.

Agenda 21. U.N. Doc. A/CONF.151/26 (Vol. II). June 13, 1992.

Declaration on the Right to Development. U.N. Doc. A/RES/41/128. December 04, 1986.

EU Renewable Energy Directive. Document 32009L0028; Directive 2009/28/EC. April 23, 2009.

Glasgow Climate Pact. U.N. Doc. FCCC/PA/CMA/2021/L.16. November 13, 2021.

International Covenant on Economic, Social and Cultural Rights. 993 U.N.T.S. 3; S. Exec. Doc. D, 95-2 (1978); S. Treaty Doc. No. 95-19; 6 I.L.M. 360 (1967). December 16, 1966.

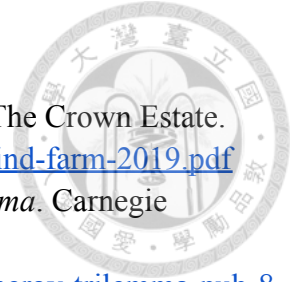
Kyoto Protocol to the United Nations Framework Convention on Climate Change. 37 I.L.M. 22 (1998); 2303 U.N.T.S. 148; U.N. Doc. FCCC/CP/1997/7/Add.1. December 10, 1997.

Paris Agreement (Conference of the Parties, Adoption of the Paris Agreement). U.N. Doc. FCCC/CP/2015/L.9/Rev/1 (Dec. 12, 2015). December 12, 2015.

Rio Declaration on Environment and Development. 31 I.L.M. 874 (1992); U.N. Doc. A/CONF.151/26 (Vol. I). June 13, 1992.

United Nations Framework Convention on Climate Change. 1771 U.N.T.S. 107, 165; S. Treaty Doc No. 102-38 (1992); U.N. Doc. A/AC.237/18 (Part II)/Add.1; 31 I.L.M. 849 (1992). May 9, 1992.

Government Publications and Reports



- Catapult. (2019). *Guide to an offshore wind farm: Updated and extended*. The Crown Estate.
<https://www.thecrownestate.co.uk/media/2860/guide-to-offshore-wind-farm-2019.pdf>
- Feigenbaum, E. A., & Hou, J. (2020). *Overcoming Taiwan's Energy Trilemma*. Carnegie Endowment for International Peace.
<https://carnegieendowment.org/2020/04/27/overcoming-taiwan-s-energy-trilemma-pub-81645>
- HM Government. (2013). *Offshore wind industrial strategy: Business and government action*.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/243987/bis-13-1092-offshore-wind-industrial-strategy.pdf
- HM Government. (2019). *Industrial strategy: Offshore wind sector deal*.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/786279/BEIS_Offshore_Wind_sector_deal_print_ready.pdf
- HM Government. (2021). *Net zero strategy: Build back greener*. Presented to Parliament pursuant to Section 14 of the Climate Change Act 2008.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf
- Natural Resource Governance Institute. (2015). *Local content: Strengthening the local economy and workforce*. https://resourcegovernance.org/sites/default/files/nrgi_Local-Content.pdf
- Offshore Wind Industry Council. (2018). *Offshore wind industry prospectus*.
https://cdn.ymaws.com/www.renewableuk.com/resource/resmgr/publications/catapult_prospectus_final.pdf
- Rowe, J., Payne, A., Williams, A., O'Sullivan, D., & Morandi, A. (2017). *Phased approaches to offshore wind developments and use of project design envelope: Final technical report*. U.S. Department of the Interior Bureau of Ocean Energy Management Office of Renewable Energy Programs.
<https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Renewable-Energy/Phased-Approaches-to-Offshore-Wind-Developments-and-Use-of-Project-Design-Envelope.pdf>
- The Crown Estate. (2019). *Information memorandum: Introducing Offshore Wind Leasing Round 4*. <https://www.thecrownestate.co.uk/media/3378/tce-r4-information-memorandum.pdf>
- The Crown Estate. (2019). *Offshore Wind Leasing Round 4 Summary stakeholder feedback report*.
<https://www.thecrownestate.co.uk/media/3332/tce-r4-summary-stakeholder-feedback-report.pdf>
- The Crown Estate. (2020). *Offshore Wind Leasing Round 4: Innovation discount policy*.
<https://www.thecrownestate.co.uk/media/3628/innovation-discount-policy-document.pdf>

- The Crown Estate. (2021). *Offshore Wind Leasing Round 4: Delivering a low carbon future*.
<https://www.thecrownestate.co.uk/media/3921/guide-to-offshore-wind-leasing-round-4.pdf>
- The Crown Estate. (n.d.). *UK Offshore Wind Development Pipeline*.
<https://www.thecrownestate.co.uk/media/3706/overview-of-uk-offshore-wind-development-pipeline.pdf>
- UK Department of Trade and Industry. (2007). *Meeting the energy challenge: A White Paper on energy*.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/243268/7124.pdf
- UN World Commission on Environment and Development. (1987). *Our common future*.
<https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>

Theses and Dissertations

- Wilson, J. C. (2007). *Offshore wind farms: Their impacts, and potential habitat gains as artificial reefs, in particular for fish*. [Unpublished master's thesis] (being a dissertation submitted in partial fulfilment of the requirements for the Degree of MSc in Estuarine and Coastal Science and Management). University of Hull.

Online Resources

- Deepwater Wind. (n.d.). *America's first offshore wind farm powers up*.
<https://dwwind.com/press/americas-first-offshore-wind-farm-powers/>
- HM Government. (November 29, 2011). *Guidance: Centres for Offshore Renewable Engineering*.
https://www.gov.uk/government/publications/centres-for-offshore-renewable-engineering?fbclid=IwAROGIowbJsrVFMgapyI_Fr-2-IFTnVmdim8e8SNyAmzHudp6vxNqg7q67AE
- HM Government. (December 30, 2011). *Statutory guidance: UK marine policy statement*.
<https://www.gov.uk/government/publications/uk-marine-policy-statement>
- Msimang, A., & Doble, M. (October 26, 2008). *Round 3 of the UK Offshore Wind Programme*.
https://www.martindale.com/legal-news/article_vinson-elkins-llp_535588.htm
- Taiwan Executive Yuan Department of Information Services. (June 13, 2019). *Offshore wind-power generation*.
<https://english.ey.gov.tw/News3/9E5540D592A5FECD/34ff3d6b-412e-458d-afe9-01737d2da52d>
- The Crown Estate. (n.d.). *The Fishing Liaison with Offshore Wind and Wet Renewables Group*.
<https://www.thecrownestate.co.uk/en-gb/what-we-do/on-the-seabed/our-partnerships/the-fishing-liaison-with-offshore-wind-and-wet-renewables-group/>

The Crown Estate. (n.d.). *Offshore Wind Leasing Round 4: Unlocking new areas of seabed for the generation of low carbon energy for millions more homes by 2030.*

<https://www.thecrownestate.co.uk/round-4/#:~:text=Offshore%20Wind%20Leasing%20Round%204%20creates%20the%20opportunity%20for%20at,to%20net%20zero%20by%202050>

The White House. (March 29, 2021). *Fact sheet: Biden Administration jumpstarts offshore wind energy projects to create jobs.*

<https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-wind-energy-projects-to-create-jobs/>

Mandarin Part

Treatises and Chapters

- 丘昌泰、黃錦堂、湯京平、洪鴻智、黃躍雯, 2006,《解析鄰避情結與政治》, 臺北: 翰蘆。
- 周桂田、張國暉, 2017,《【能】怎麼轉: 啟動臺灣能源轉型鑰匙》, 臺北: 巨流。
- 陳芙靜、李孟諺, 2010,《全球離岸風力發電市場前景分析》, 臺北: 經濟部技術處。
- 陳恆鈞, 2012,《治理互賴理論與實務》, 臺北: 五南。
- 陳敏, 2016,《行政法總論》, 第九版, 臺北: 作者自版。
- 黃異, 2018,《漁業法》, 臺北: 新學林。
- 葉俊榮, 1997a,《環境行政的正當法律程序》, 再版, 臺北: 三民。
- 葉俊榮, 1997b,《環境理性與制度抉擇》, 臺北: 三民。
- 葉俊榮, 2002,《環境政策與法律》, 臺北: 元照。
- 葉俊榮, 2015,《氣候變遷治理與法律》, 臺北: 國立臺灣大學出版中心。
- 葉俊榮、張文貞、林春元 (編), 2020,《建構氣候轉型立法: 比較立法與議題論述》, 臺北: 新學林。
- 饒瑞正 (編), 2021,《離岸風電的政策、法律、經濟與風險》, 臺北: 元照。
- Clark, C., & Tan, A. C. (著); 劉詩芃等 (譯), 2016,《台灣政治經濟學》, 臺北: 五南。

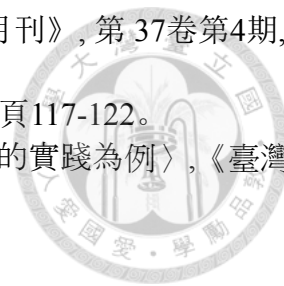
Periodicals

- 林明照、陳盟仁、林錦章、吳清木, 2006, 〈風力發電站專案分析〉, 《工程科技與教育學刊》, 第3卷第3期, 頁322-340。
- 范建得, 2009, 〈美國及西班牙推廣風力發電經驗於我國之借鏡〉, 《臺灣科技法律與政策論叢》, 第6卷第1期, 頁193-235。
- 邱文彥, 2019, 〈從海洋政策觀點論臺灣離岸風場之發展〉, 《國家發展研究》, 第18卷第2期, 頁55-124。
- 徐力平、林新華, 2019, 〈英國離岸風電本土產業鏈發展經驗〉, 《營建知訊》, 第433期, 頁24-27。

徐昕煒, 2014,〈英國離岸風電產業策略與我國借鏡〉,《臺灣經濟研究月刊》,第37卷第4期,頁119-126。

陳中舜, 2018,〈臺灣風電產業的回顧與展望〉,《經濟前瞻》,第179期,頁117-122。

張文貞, 2012,〈NGO與跨國憲政主義的發展:以台灣加入國際人權公約的實踐為例〉,《臺灣國際法季刊》,第9期第3號,頁47-72。



Laws and Court Decisions

臺灣,《中華民國憲法》,國民政府令。(1947).

<https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=A0000001>

臺灣,《環境基本法》,總統華總一義字第 09100238990 號令 (last amend.). (2002).

<https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=O0100001>

臺灣,《環境影響評估法》,總統華總一義字第 09100255720 號令 (last amend.). (2003).

<https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=O0090001>

臺灣,《海岸管理法》,總統華總一義字第 10400012591 號令。(2015).

<https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=D0070222>

臺灣,《漁業法》,總統華總一經字第 10700140851 號令 (last amend.). (2018).

<https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=M0050001>

臺灣,《國有財產法》,總統華總一經字第 10700125391 號令 (last amend.). (2018).

<https://law.moj.gov.tw/LawClass/LawAll.aspx?PCode=G0370001>

臺灣,《電業法》,總統華總一經字第 10800050761 號令 (last amend.). (2019).

<https://law.moj.gov.tw/LawClass/LawHistory.aspx?pcode=j0030011>

臺灣,《水利法》,總統華總一經字第 11000049221 號 (last amend.). (2021).

<https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=J0110001>

臺灣,《再生能源發展條例》,總統華總一義字第 09800166471 號令。(2009).

<https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=j0130032>

行政院環境保護署,〈政府政策環境影響評估作業辦法〉,行政院環境保護署環署綜字第 0950021971 號令。(2006).

<https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=O0090029>

行政院農業委員會,〈離岸式風力發電廠漁業補償基準〉,農漁字第1051328879A號令。(2017).

<https://law.coa.gov.tw/GLRSnewsout/LawContent.aspx?id=GL000773>

經濟部,〈風力發電示範系統設置補助辦法〉,經濟部(89)經能字第 89314400 號令。(2000).

<https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=J0130022>

經濟部,〈風力發電離岸系統示範獎勵辦法〉(currently the“〈離岸風力發電示範獎勵辦法〉”),經濟部經能字第 10104604190 號令。(2012).

<https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=J0130063>

經濟部,〈電力開發協助金運用與監督管理辦法〉,經濟部經能字第 11104601780 號令 (last amend.). (2022). <https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=J0130087>

司法院,〈司法院大法官釋字第400號解釋〉。(1996).

<https://cons.judicial.gov.tw/docdata.aspx?fid=100&id=310581&rn=11026>



Government Publications and Reports

行政院環境保護署, 2016,《環境影響評估審查委員會第306次會議議程》。

https://doc.epa.gov.tw/IFDEWebBBS_EPA/Download.ashx?Guid=a8da6306-f9df-4a89-a326-70b6a1f37ffa&type=306%E6%AC%A1%E6%9C%83%E8%AD%B0%E9%96%8B%E6%9C%83%E9%80%9A%E7%9F%A5_%E9%99%84%E4%BB%B6.pdf

交通部, 2017,《離岸風電海下工程技術研發計畫(106-109年)(核定本)》。

<https://www.iot.gov.tw/dl-17424-7973b995c28a4581ba5d4cdb1d6365cd.html>

經濟部能源局, 2017,《風力發電4年推動計畫(核定本)》。

https://www.moeaboe.gov.tw/ECW/populace/content/wHandMenuFile.ashx?menu_id=5493&file_id=4107

施信民 (計畫主持人), 2002,《再生能源與其相關產業之發展策略研究》(行政院經濟建設委員會九十一年度委託研究計畫: PG 91060627; 研究單位: 台灣二十一世紀議程協會)。

<https://ws.ndc.gov.tw/001/administrator/10/refile/5657/4222/0008954.pdf>

Theses and Dissertations

黃嘉偉, 2020,〈政策支持與產業發展之關聯性研究—以我國風力發電產業為例〉, 國立臺灣大學社會科學院國家發展研究所碩士論文。

葉進雄, 2007,〈我國漁業管理法制之研究〉, 國立臺灣海洋大學海洋法律研究所碩士學位論文。

張睿寧, 2021,〈制度及場域的不對稱邏輯: 我國離岸風場環評與漁業補償關聯的發展與變遷〉, 國立臺灣大學社會科學院國家發展研究所碩士論文。

Online Resources

公共政策網路參與平台, 2021,〈經濟部公告:預告「電力開發協助金運用與監督管理辦法」第6條之1、第9條及第7條附表修正草案〉,

<https://join.gov.tw/policies/detail/8e06614f-6ba1-4cda-aaa6-210285cb661e>

台灣風力發電產業學會, 2013,〈竹南離岸風力發電計畫 首次環評出師不利〉,

http://www.twtia.org.tw/Industry_List_m.aspx?id=4380

台灣環境資訊協會環境資訊中心, 27 September 2017,〈都是為了錢? 離岸風機帶動漁村共榮? 彰化漁會觀點〉, <https://e-info.org.tw/node/207497>

自由時報, 28 July 2015,〈離岸風力發電施工 80艘漁船抗議〉,

<https://news.ltn.com.tw/news/local/paper/901562>

行政院農業委員會水產試驗所, 21 February 2017,〈離岸風機海藻牧場設置之可行性研究〉,

https://www.tfrin.gov.tw/News_Content.aspx?n=226&s=231694

- 行政院, 2019,〈全力推動離岸風電—打造台灣成為亞洲離岸風電技術產業聚落〉, <https://www.ey.gov.tw/Page/5A8A0CB5B41DA11E/9eebb9b8-490b-4357-963f-a48a981852a7>
- 行政院農業委員會水產試驗所, 12 April 2019, 〈水產試驗所研發離岸風電與漁業共享海域之新模式〉, https://www.tfrin.gov.tw/News_Content.aspx?n=241&s=54717
- 孫文臨, 28 December 2020, 〈北海岸建離岸風電 學者估影響台灣七成漁獲 漁民: 反對到底〉, <https://e-info.org.tw/node/228767>
- 彭杏珠, 28 June 2016, 〈漁業權補償金喬不攏 離岸風電恐難產〉, <https://www.gvm.com.tw/article/21954>
- 經濟部能源局, 2021, 〈108_109年度全國電力資源供需報告〉, https://www.moeaboe.gov.tw/ECW/populace/content/ContentLink2.aspx?menu_id=48&sub_menu_id=8749
- 經濟部能源局, n.d., 〈10-5 發電結構(一)〉, https://www.moeaboe.gov.tw/ECW/populace/web_book/wHandWebReports_File.ashx?type=office&book_code=M_CH&chapter_code=K&report_code=11
- 蔡佳珊、程怡綾, 31 July 2021, 〈08 越洋專訪〉借鏡英國經驗, 首重海洋空間規劃, 保障公民參與, <https://www.newsmarket.com.tw/blog/155678/>

Japanese Part

Treatises and Chapters

北村 喜宣『現代環境規制法論』(上智大学出版、2018年)。