



UNSW Collaboration on Energy and Environmental Markets

UNSW Submission to Senate Select Committee on Energy Planning and Regulation in Australia

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Executive Summary

The UNSW Collaboration on Energy and Environmental Markets (CEEM) welcomes the opportunity to make a submission to the Select Committee on Energy Planning and Regulation in Australia.

UNSW CEEM undertakes interdisciplinary research into the design, analysis and performance monitoring of energy and environmental markets and their associated policy frameworks. This includes bringing together expertise in Distributed Energy Resources (DER, increasingly referred to as Consumer Energy Resources or CER) and a commitment to open-source software and data, in order to support research, tools, and policy insights for energy markets.

This submission focuses on the following issues:

- The suitability of the NEM's institutional and governance arrangements in a rapidly changing energy system
- Improving the openness and accessibility of the NEM's primary planning processes

Based on an independent assessment of these issues by UNSW CEEM, the following recommendations are put forward in the submission:

- 1. Independent review of present institutional arrangements, including the Australian Energy Market Agreement, alongside any post-2030 market reforms. This should reflect the increased direct involvement of participating jurisdictions.**
- 2. Integrate and appropriately resource consumer representatives and the demand side¹ formally in governance arrangements and institutional settings.**
- 3. Align planning activities with open data and open software principles.**

Please contact Dr Dylan McConnell regarding this submission (), or Joint Directors Professor Iain MacGill (), and/or Associate Professor Anna Bruce () for other matters related to the UNSW Collaboration on Energy and Environmental Markets (CEEM).

¹ For ease of reading we have used the term 'demand side', although we would like to emphasise that one of the key changes to occur in the NEM is the emergence of consumer energy resources (CER), which are a significant source of generation. Thus, the 'demand side' is made up of conventional demand and CER.

1. Institutional and governance arrangements

This inquiry offers an opportunity to consider the institutional arrangements guiding Australia's electricity system as it undertakes a profound transformation. This section firstly provides a brief background on the origins of existing institutional arrangements and then traces their evolution in recent years. It aims to highlight the potential challenges and issues in the NEM's institutional and governance arrangements that have arisen as a consequence of recent changes in technology cost and emission reduction priorities.

1.1. Historical context

The current institutional arrangements and market settings are largely the result of national competition policy reforms initiated in the early 1990's. A series of reports and inquiries culminated in, amongst other things, a 'Competition Principles Agreement' between state governments to facilitate the introduction of a market-based, competitive electricity supply system [1]. Significantly, this was an outcome of "co-operative federalism"; that is, reforms were agreed upon by the federal, state and territory governments that constituted the then Council of Australian Governments (COAG)² [2,3]

Key founding principles included [4,5]:

- Establishing a set of highly prescriptive market rules that market participants could sufficiently trust when making long-term investment decisions.
- Developing a set of governance arrangements to support the efficient operation and development of a rule-based market, including strict separation from Government and other stakeholders³
- Consistency in the overall decision-making framework across a decade or decades – timescales over which key investment decisions are made in the electricity industry.

The key legislation underpinning the formation of the National Electricity Market (NEM) was passed in 1996. The National Electricity Law (NEL) is contained within an act of South Australian parliament that was cooperatively adopted and applied as law in each participating jurisdiction of the NEM by application statutes. Significantly, no environmental objectives (including those pertaining to climate change or greenhouse gas emissions reductions) were included in this law.

Following an independent review (the 'Parer Review') of the nascent electricity market, the current institutional arrangements were initially codified in the Australian Energy Market Agreement (AEMA) with the aim of improving and streamlining governance arrangements for the nation's energy sector. Under this agreement, the Australian Energy Market Commission (AEMC) and the Australian Energy Regulator (AER) were created⁴.

² Electricity remains a so-called 'residual power': not explicitly listed in the constitution and so a State responsibility

³ Drafting instructions of the National Electricity Code in 1996 included: "As this body is to monitor the operation of the market and to establish the rules of the game, it is to be a total separate entity from users, governments and other stakeholders such as the market manager and systems operator"

⁴ NEMMCO was established in 1996 to administer and monitor the National Electricity Market, and was later succeeded by the Australian Energy Market Operator (AEMO).

1.1.1. Recent years

Since the establishment of the NEM, there have been two fundamental shifts in the Australian electricity industry:

1. A greater desire to reduce the greenhouse gas emissions associated with electricity generation
2. The cost of some key renewable energy technologies has reduced dramatically in the last two decades

Furthermore, these shifts have together contributed to a higher level of consumer engagement and participation, mostly notably through the unprecedented, widespread installation of consumer-owned, distributed energy resources (particularly rooftop solar photovoltaics, or rooftop solar PV) in homes and businesses across Australia.

In the midst of these shifts, the NEM's governance and institutional arrangements have proved to be both a blessing and a curse. The stability of the market framework, a product of market body independence and the delegation of regulatory functions limiting direct government influence on the day-to-day operation of the market, has also meant that the NEM has struggled to swiftly address the many challenges of the energy transition [2]. Despite the deeply transformative nature of the shifts that have occurred in the NEM, there has been little change made to its governance arrangements or institutional settings to ensure that the system and market are better equipped to respond to the demands of a rapidly changing system.

1.1.2. Previous reviews of the NEM's governance and institutional arrangements

There have been a number of previous reviews that have assessed the suitability of the NEM's governance arrangements. This includes the Vertigan Review in 2015, which specifically focused on governance. Despite acknowledging an *"unprecedented"* pace of change, this review found that these governance arrangements were *"fundamentally sound"* and *"amongst best practice internationally"*. It did, however, note the existence of a strategic policy deficit, which has led to *"diminished clarity and focus in roles, fragmentation and a diminished sense of common purpose"*.

Not long after the Vertigan review, an Independent Review into the Future Security of the National Electricity Market, chaired by Australia's chief scientist Alan Finkel (Finkel Review) was commissioned, in part due to the challenges facing an electricity system in transition. This much broader ranging review came to quite different conclusions to Vertigan with respect to governance arrangements. This review identified an accountability deficit as a result of *'unclear allocation of regulatory and operational responsibilities'* between the different levels of government in Australia. Following this review a further market institution was created – the Energy Security Board (ESB) – which comprised the heads of all three market institutions (the AEMC, AEMO, and the AER), as well as an independent chair and deputy chair. The Energy Security Board was to be responsible for *'whole-of-system oversight for energy security and reliability of the national electricity market; and improving long-term planning for the national electricity market'*.

1.2. Issues with the existing institutional and governance arrangements

1.2.1. The ESB and EAP: conflicting and blurred responsibilities

The establishment of the ESB directly conflicted with the NEM's founding principles and its original governance framework. At a high level, the ESB was designed to bring all the NEM institutions into the rule-making process, something that the original Code instructions expressly tried to prevent. This was also somewhat counter to the Vertigan view that *"the Panel considers that AEMO should not be specifically tasked with policy or market development roles"*.

In addition, the establishment of the ESB blurred market body responsibilities through the "Section 90F" rule making process. Section 90F provides a mechanism for making amendments to existing rules: when a recommendation made by the ESB is endorsed by territory, state and federal Energy Ministers, it becomes a new Rule, thereby subverting the existing process that is managed by the AEMC. In 2020, this process was (controversially) used to apply an interim reliability standard that is much tighter than the standard set by the AEMC's independent reliability panel. This tightening comes at cost to energy consumers, and may also have contributed to other decisions, including the NSW Government's decision to support the continued operation of the Eraring coal fired power station.

The ESB itself was reviewed in 2020 (Edwards review) which recommended there be an *"orderly wind up of the ESB"*. In addition, the Edwards review suggested it should be made *"explicit that the ESB will not use, or should not use, the s90F process for the making of recommendations to Energy Ministers"*. This body has itself transitioned to become the Energy Advisory Panel (EAP), which is now chaired by the Chair of the AEMC. It is unclear if this avenue for rule change still exists, and if so, whether it should.

1.2.2. Re-emergence of the State

It is notable that much of the generation investment in the NEM over its existence has been explicitly or indirectly driven by State and Federal governments including through State owned electricity generators and specific policies such as the MRET and various State government mechanisms such as the Queensland 13% Gas Scheme. Still, in recent years, we have seen broader moves away from a primarily market-driven approach to additional investments in large-scale generation and firming. Governments and other decision-makers clearly have doubts about the ability of the market to deliver sufficient investment and have moved beyond the existing NEM frameworks and market structures [6]. States are increasingly derogating away from the National Electricity Rules as they see fit. Both Federal and State-based policy continue to expand and include (but are not limited to):

- **South Australia**
 - Tendering for Hornsdale Power Reserve battery
 - Procurement of the two 'Temporary' State-owned generators
 - Emergency Powers to the State Minister to direct market participants, Emergency Management (Electricity Supply Emergencies) Amendment Act (2017)
- **Victoria**
 - VRET1 & VRET2
 - The Nation Electricity Victoria Amendment Act (2020)
 - National Electricity (Victoria) Amendment (VicGrid) Act 2024
 - The re-introduction of the State Electricity Commission

- Significant commitments to support an offshore wind industry
- **NSW**
 - The NSW Energy Infrastructure Act (2020)
 - Establishment of “AEMO Services” as Consumer Trustee
 - Establishment of EnergyCo as Infrastructure Planner
 - Introduction of a new state-owned entity, the Energy Security Corporation of NSW.
- **Queensland**
 - Energy (Renewable Transformation and Jobs) Act 2024
 - Establishment of Queensland Energy System Advisory Board
 - Copper String 2.0
- **Commonwealth:**
 - Participation and impact on the electricity market through Snowy (Snowy 2.0, Kurri Kurri)
 - Transmission build-out through Rewiring the Nation
 - Greatly expanding the Capacity Investment Scheme

Implicitly, these developments reflect a loss of faith in, if not outright rejection of, the current energy market and arrangements. Australian governments and decision-makers have seemingly already made up their minds and have moved away from the principles on which the market is based and was established – namely that market price signals can coordinate efficient investment and operational decisions. These developments are not well acknowledged by Australia’s energy rule-makers and regulators or reflected in the existing institutional and governance arrangements [5].

Since the formation of the NEM, regulatory functions have increasingly been conferred to the national energy regulator, the AER, with jurisdictional regulators diminishing in role and resourcing. It is not clear that AER is appropriately placed to regulate some of these initiatives, nor if the States’ regulators are resourced to provide any necessary regulatory function. The increased involvement of the Commonwealth in the NEM, through Rewiring the Nation, the Capacity Investment Scheme, and Snowy Hydro also presents potential conflicts for the AER.

1.2.3. Expanded planning role for AEMO

These changes have occurred alongside a greatly expanded planning role for the Australian Energy Market Operator (AEMO). While AEMO has had some functions as the “National Transmission Planner” since its formation, the significance of the role and planning activities undertaken by AEMO has grown substantially. This growth has occurred through activities such as the Integrated System Plan, which have now become “actionable”, as well as through the activities of related entities and subsidiaries (for example AEMO Services in NSW, or AEMO Victoria Planning, AVP). Through AEMO Services, new generation capacity is tendered as part of the NSW Electricity Infrastructure Roadmap. AEMO Services was also appointed as the delivery partner for the Commonwealth’s Capacity Investment Scheme and is similarly tendering for generation capacity. A new company, Transmission Company Victoria, was established as a subsidiary of AEMO to progress the Victoria-NSW Interconnector. These activities, among other factors, were reflected in a significant increase in AEMO’s operating costs from approximately \$200 million in FY18 to \$740 million in FY24. While AEMO does extremely valuable work through these processes, it is not clear that the existing governance arrangements reflect this growing role and are therefore not fit for purpose.

The membership of AEMO and its subsidiaries is also a potential issue. AEMO is a not-for-profit organisation, registered as a public company limited by guarantee. Its membership is split between Government and Industry Members (a 60%-40% weighting on Government and Industry Member voting rights). AEMO Services has two members: AEMO (70%) and the NSW Government (30%). Membership dominated by government and industry may fail to appropriately represent consumer interests and reflect the significance of consumer-owned, distributed energy resources in the market and power system. Furthermore, the market operator is increasingly incorporating Government policy into their processes, despite AEMO being viewed as independent and at arm's length from Government.

It's also not clear that the cost recovery arrangements for AEMO are necessarily appropriate for this increased planning role. The 2015 'Vertigan review' made comments on this that are still relevant, if not more so, today. Specifically, the review suggested that:

"... The Panel considers that AEMO should not be specifically tasked with policy or market development roles, and that it should be more clearly focused on developing procedures for the purposes of market operation within the energy market. AEMO's contribution to more general market development should be through the AEMC's recommended strategic process. In relation to roles other than market operations, the Panel's view is that AEMO should only undertake tasks outside of its core responsibilities where they do not conflict with those responsibilities and are undertaken on a contractual basis"

And that:

".. Costs for other activities such as the provision of policy advice and systems planning for other individual jurisdictions should be recovered through fee-for service or other arrangements."

While some activities are provided as contract services (such as those provided by AEMO Services), there may be scope for alternative cost recovery arrangements or institutional arrangements more broadly (e.g. in the case of the ISP).

Internationally, there is a broad range of arrangements to suit particular circumstances and developments. There is no particularly dominant or "superior" arrangement. In some cases, system planning is separate from system operation. For example, in many jurisdictions in the United States, Public Utility Commissions are responsible for 'Integrated Resources Planning' (a process somewhat similar to the ISP), whereas Independent System Operators or Regional Transmission Organisations are responsible for power system and market operation. In other jurisdictions, the system operator may also have planning responsibilities. Great Britain's newly established National Energy System Operator (NESO) provides broad strategic oversight of both the electricity and gas systems – something that has been critiqued as missing from the current arrangements.

1.2.4. Consumers and the emergence of distributed energy resources

The dramatic falls in the cost of rooftop solar PV and, consequently, its widespread uptake on more than 3.5 million homes across Australia, has dramatically disrupted the Australian electricity sector. This has presented a competitive alternative to traditional supply-side service providers and changed the nature of the interactions between consumers and the power system and market. Although

distribution networks are regulated as monopolies, it can be argued that, with the emergence of CER that can provide network services, they are no longer strictly monopolies. These new dynamics have exacerbated existing issues with the governance arrangements, including the supply-side focus of the NEM and lack of formal representation of consumer groups in institutional settings.

An early review of the NEM (Parer 2002) identified that the NEM systems are supply-side focused, resulting in the system missing out on the value that demand-side resources might bring to the market. While there have been some attempts at reform, there is still a significant absence of demand-side activity or focus on this incredibly significant part of the electricity system in planning processes and governance arrangements. For example, though the ISP includes considerable capacity additions of consumer-owned distributed energy resources in its optimal development path, it is an input assumption (provided by consultants), into what is largely a transmission planning process that predominantly identifies supply-side solutions. The expansion of rooftop solar PV (largely treated as being 'behind the meter', and thus on the demand side) and the nascent emergence of distributed batteries (standalone or, more significantly, within electric vehicles) makes the need to reform oversight of the demand-side more acute.

Formal consumer representation across the market institutions and governance arrangements has also historically been lacking. While consumer groups can participate in consultation mechanisms, and organisations like Energy Consumers Australia can support consumers to do so (and engage in these processes themselves), these activities are outside the formal institutional and governance arrangements of the NEM. As consumers increasingly become active participants in the energy system, it is imperative that consumer advocates and consumers themselves should be well represented in the NEM's governance arrangements.

1.3. Recommendations

- **Independent review of the institutional arrangements, including the Australian Energy Market Agreement, alongside any post-2030 market reforms. This should reflect the increased direct involvement of participating jurisdictions.**
- **Integrate consumer representatives and the demand side more formally in governance arrangements and institutional settings.**

2. Open-source models & data in planning

As the importance and scale of the energy transition and its associated challenges have become more apparent, it has become clear that decision-making by policy-makers and planners can have profound consequences. As such, there have been increasing calls for the modelling underpinning energy system planning to be conducted in an open and transparent manner. The open and transparent approach has been argued for based on a number of potential benefits [6-8]:

- Increasing public trust in the energy system planning process, which is of particular importance given the highly contested nature of many aspects of the transition. For example, the siting of wind and solar generation, new transmission lines, and the role of nuclear energy.
- Improved quality by allowing for review and reproducibility. An illustrative counter example is the Reinhart-Rogoff economic modelling error, which influenced the global austerity debate, and wasn't identified until the model was shared with a third party years later [8-9].

- Improved collaboration and productivity. Sharing modelling software and input data reduces redundant effort and frees up more time and resources for addressing the complex challenges of the energy transition.

2.1. An international shift towards open-source modelling

Internationally, the European parliament passed regulations with guidelines for trans-European energy infrastructure development[10]. Based on these guidelines, a scientific advisory council later recommended a harmonised EU energy system-wide cost-benefit analysis[11]. This included, among other things that:

...models used by [European Network of Transmission System Operators for Electricity] to calculate projects' relative costs and benefits should be made as accessible as possible based on existing good practice across the world in line with the FAIR (findable, accessible, interoperable and reusable). The models could be uniformly applied by [the system operators] and made available to non-[transmission system operator] project promoters for the [cost-benefit analysis] calculations.

This has filtered into more concrete methodologies in different processes. For example, this "Harmonised system-wide cost-benefit analysis for candidate electrolyser projects" [12]:

"While project promoters are free to select any modelling tool for the assessment of the benefits of their candidate electrolyser projects, it is recommended, when possible and relevant, the use of an open source tool (for instance, PyPSA [4]) to foster transparency."

A similar document, "Harmonised system-wide cost-benefit analysis for candidate hydrogen projects" [13], suggested that:

"While [the European Network of Transmission System Operators for Gas is free to select any modelling tool for the assessment of the benefits of candidate hydrogen projects, it is recommended, when possible and relevant, the use of an open source tool (for instance, PyPSA [5]) to foster transparency".

In the United States, the White House issued a statement last year titled "Methodologies and considerations for integrating the physical and transition risks of climate change into macroeconomic forecasting" [14] that called for openness and accessibility in quantitative models. While not strictly stated in the context of energy system modelling, the broad principles are still relevant:

"6. Model is open-source and peer-reviewed

Openness and transparency are important to generating confidence in government analysis and enabling equitable participation in public processes. The Administration is committed to principles of open government (White House 2022b). Models used for climate, energy, and macroeconomic analysis vary substantially in their degree of openness. Public accessibility is not a binary measure: for instance, model equations may be publicly documented, but the datasets or software required to run the model may require licenses. While proprietary models may by necessity play a role for some government applications, public accessibility and peer-review is a desirable criterion."

It is also the case that United States National Renewable Energy Laboratory (NREL) has published many of their models open source. This includes their widely used Resource Planning Model, which is analogous to the model used in the ISP, and their Sienna modelling framework, which can be used to test the operational performance of power systems and electricity markets.

2.2. The ISP, and open data and software practices

The Integrated System Plan (ISP), which has been developed and updated by AEMO every two years since 2018, is the primary long-term modelling and planning study for the NEM. The primary purpose of the ISP is to support AEMO in its function as the National Transmission Planner, but more broadly, it offers an energy transition roadmap for the NEM that is used extensively by a diverse set of stakeholders.

The ISP development process already incorporates some open and transparent practices. Specifically, the inputs, assumptions and methodologies used in the ISP are made publicly available for consultation purposes. However, the availability of these inputs has also led to their reuse by government departments, regulators, market participants, research organisations, and advocacy groups in internal modelling exercises that support investment and planning processes. This reuse avoids the unnecessary duplication of these large and complex datasets and enables additional scrutiny and review of the modelling assumptions.

There are also areas of the ISP development process that could benefit from further openness and transparency. To produce the ISP, AEMO uses PLEXOS, a proprietary commercial energy system modelling software product. The ISP modelling data is made publicly available but is published in PLEXOS input and Microsoft Excel formats. Although the PLEXOS file format makes the reuse of ISP inputs very straightforward for PLEXOS users, the Microsoft Excel format employs data handling practices that make reusing this data with alternative modelling software challenging. Given the costs associated with PLEXOS licensing, the publication of ISP input data in these formats may implicitly impose a barrier to participation in the planning process by limiting which stakeholders can participate in an in-depth review of the ISP, assess the impact of various assumptions and explore alternative scenarios. Additionally, the dominance of a single modelling software and approach may be encouraging an “analytical monoculture” [15], which could lead to a planning process that is less robust.

Continuing to adopt practices that open up the planning process and promote accessibility and participation is likely to help support rigorous review, diverse approaches and perspectives, efficient engagement and trust in the planning process. With the increasing adoption of open modelling practices internationally, a growing set of high quality open-source and freely available electricity system planning tools has become available [16]. Should ISP datasets be published in a more accessible manner (e.g. machine-readable input data), such tools could be used alongside PLEXOS to by stakeholders to better explore methodological improvements and a diverse set of alternative approaches.

2.3. Recommendations

- **Better align planning activities with open data and software principles**

References

- [1] Haines, F., & McConnell, D. (2016). Environmental norms and electricity supply: An analysis of normative change and household solar PV in Australia. *Environmental Sociology*, 1–11.
- [2] Kallies, A. (2021). The Australian Energy Transition as a Federalism Challenge: (Un)cooperative Energy Federalism? *Transnational Environmental Law*, 10(2), 211–235.
- [3] Godden, L., & Kallies, A. (2021). Governance of the energy market in Australia. In *Elgar Encyclopedia of Environmental Law* (pp. 204–215). Edward Elgar Publishing.
- [4] McConnell, D. (2023). AEMA 2.0? Governance of the Energy Transition, State of Energy Research Conference 2023
- [5] Outhred, H. "Electricity Industry Restructuring in Australia: Underlying Principles and Experience to Date." In *System Sciences*, 2007. HICSS 2007. 40th Annual International Conference, 125–125, 2007.
- [5] Dylan McConnell & Iain Macgill. (2023). "When a climate crisis meets an energy crisis—Lessons from the Australian National Electricity Market". In Rahmat Poudineh (Ed.), *Electricity market design during the energy transition and the energy crisis* (136th ed., pp. 49–55). Oxford Institute for Energy Studies.
- [6] Morrison, R., 2018. Energy system modeling: Public transparency, scientific reproducibility, and open development. *Energy Strategy Reviews* 20, 49–63. <https://doi.org/10.1016/j.esr.2017.12.010>
- [7] Pfenninger, S., Hirth, L., Schlecht, I., Schmid, E., Wiese, F., Brown, T., Davis, C., Gidden, M., Heinrichs, H., Heuberger, C., Hilpert, S., Krien, U., Matke, C., Nebel, A., Morrison, R., Müller, B., Pleßmann, G., Reeg, M., Richstein, J.C., Shivakumar, A., Staffell, I., Tröndle, T., Wingenbach, C., 2018. Opening the black box of energy modelling: Strategies and lessons learned. *Energy Strategy Reviews* 19, 63–71. <https://doi.org/10.1016/j.esr.2017.12.002>
- [8] Pfenninger, S., DeCarolis, J., Hirth, L., Quoilin, S., Staffell, I., 2017. The importance of open data and software: Is energy research lagging behind? *Energy Policy* 101, 211–215. <https://doi.org/10.1016/j.enpol.2016.11.046>
- [9] Thomas Herndon, Michael Ash, Robert Pollin, Does high public debt consistently stifle economic growth? A critique of Reinhart and Rogoff, *Cambridge Journal of Economics*, Volume 38, Issue 2, March 2014, Pages 257–279, <https://doi.org/10.1093/cje/bet075>
- [10] European Union. (2022). *Regulation (EU) 2022/869 of the European Parliament and of the Council of 30 May 2022 on the Union-wide emissions trading system*. Official Journal of the European Union. <https://eur-lex.europa.eu/eli/reg/2022/869/oj>
- [11] European Scientific Advisory Board on Climate Change. (2023). *Towards a decarbonised and climate-resilient EU energy infrastructure: Recommendations on a harmonised EU energy system wide cost–benefit analysis*. Publications Office. <https://data.europa.eu/doi/10.2800/55585>
- [12] Careri F., Irazoqui C., *Harmonised system-wide cost-benefit analysis for candidate electrolyser projects*. Final, May 2023, European Commission, Petten, 2023, JRC133051.
- [13] Careri F., Irazoqui C., Efthimiadis T., *Harmonised system-wide cost-benefit analysis for candidate hydrogen projects*. Final, May 2023, European Commission, Petten, 2023, JRC133050
- [14] Council of Economic Advisers. (2023). *Methodologies and considerations for integrating the physical and transition risks of climate change into macroeconomic forecasting for the President's budget*. The White House. <https://www.whitehouse.gov/cea/written-materials/2023/03/14/methodologies-and-considerations-for-integrating-the-physical-and-transition-risks-of-climate-change-into-macroeconomic-forecasting-for-the-presidents-budget/>
- [15] Bronk, R., 2013. Hayek on the wisdom of prices: A reassessment. *Erasmus Journal for Philosophy and Economics* 6, 82–107. <https://doi.org/10.23941/ejpe.v6i1.120>
- [16] Initiative, O.E.M., 2022. *Open Models - wiki.openmod-initiative.org* [WWW Document]. URL https://wiki.openmod-initiative.org/wiki/Open_Models (accessed 2.24.2022).