

Submission on a proposed Data Act for the European Union from the perspective of open energy system analysis

European Commission public consultation closing 25 June 2021

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| Organisation | Representing ourselves as individuals (the European Commission classified us as an “informal organisation” for the purposes of previous submissions) |
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| Public release | The statement may be made public without redacting personal details |
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This statement accompanies our web-based public submission on a proposed Data Act being undertaken by the Data Policy and Innovation Unit G.1 of the European Commission Directorate-General CNECT. Submissions close on 25 June 2021. The underpinning consultation document is [European Commission \(2021\)](#). See the Commission [website](#) for more details.



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1 Summary

This section provides a summary of our views with some of the key points given here later expanded upon. Our remarks are made in the context of our domain, which is **public-interest energy system analysis** with an emphasis on open source development, genuinely open data, and scientific cooperation. We presume that the data under discussion is machine-readable unless otherwise indicated.

1.1 Our requests

On the basis of the inception impact assessment report issued by the Commission ([European Commission 2021](#)), the submitters advocate the following:

1. that all information provided under **statutory reporting** be explicitly accessible and open licensed (for example, mandatory reporting by electricity market exchanges appears to be implemented so as to intentionally restrict recovery)
2. moreover, under current legislation much of the material under statutory reporting can be **legally withdrawn from public access after 5 years** (not that we have examples of this occurring)
3. that **closed public-interest databases** (such as the ENTSO-E sponsored Pan European Market Modelling Database) be made public and explicitly open licensed
4. that **business-to-government** (B2G) information, suitably aggregated, anonymized where necessary, and open licensed would substantially improve the accuracy and legitimacy of our analysis
5. further to the above, typical construction and operations **cost information** would greatly assist
6. that the Commission provide **legal opinions on the interoperability** of the growing number of **national level data licenses** within the European Union (including the German dl-de/by-2.0 and French Licence Ouverte licenses and also the United Kingdom OGL-UK-3.0 license, noting that the UK National Grid continues to supply data to the ENTSO-E Transparency Platform post Brexit) with regard to the Creative Commons CC-BY-4.0 license — or alternatively legislate to prevent a proliferation of **data silos** that would naturally arise from incompatible data licensing
7. that **96/9/EC database protection** has outlived any usefulness and should be repealed — indeed, database protection in our realm provides only legal uncertainty, inhibiting risk-averse institutions and researchers but not others, and is routinely ignored by data portals operating from the United States in any case

1.2 Commentary

Our community (see section 2.2) has been **formally engaging with the European Commission** on these matters since 2017 ([Morrison et al 2017](#), [Morrison 2020](#)). And also with various providers of information under statutory reporting within the European energy sector since somewhat earlier. Indeed, almost none of the issues raised here are new. What is novel is the increasingly deep community-wide cooperation on data management within our domain, a dynamic that has only really become evident in the past two years.

Our community is increasingly desperate for access to reasonable quality **legally-reusable public-interest data** covering the European energy sector — indeed it is hard to overstate how debilitating the current legal regime is for those pursuing independent public-interest energy systems analysis. For us, “legally-reusable” means explicitly licensed under Creative Commons CC-BY-4.0, CC0-1.0, or something inbound compatible. That is because any other choice of license, even if technically data-capable

and approved as open,¹ will necessarily create **data silos** due to incompatible legal requirements (see section 3.6).

As indicated, our own **data management paradigm** is shifting from one of classical databases and schemas, whether local or web-accessible, to domain-wide data use and management (see section 4.1). This paradigm shift is contingent on two factors. First, sufficient community agreement on and adoption of high-level data “specifications” covering specifically: structured semantics (and preferably a formal ontology), metadata practices, collection protocols, and information exchange formats. And second, the application of open licenses as articulated in the previous paragraph.

Our community deals only with **non-personal information** that has been or can be **legitimately published** — hence issues of personal and commercial privacy are not material.

We will later provide examples of the hindrances we collectively encounter that derive primarily from the **current statutory environment** in Europe. These issues can, therefore, be best remedied by legislative reform. In which case, we welcome the opportunity to offer input to a **proposed Data Act** based on our experiences. We will also cite some current instances of good practice to indicate how things could and should be.

Many in our community also work for **risk-averse intuitions** and a presumption of free-to-republish in the absence of suitable open licensing is not an option. Furthermore, many academic journals require an explicit declaration that such rights are held. These rights are then often routinely transferred to the publisher although the authors may also select from a range of Creative Commons licenses.²

Analysis from **trusted and reliable sources** is critically important for the rapid and complete decarbonization of our society and that analysis is, in turn, critically dependent on good quality usable and reusable data. Moreover science is facing a **reproducibility crisis** and the measures we advocate here should assist.

If the proposed Data Act actions **only one of our concerns**, let it be this:

- mandate that all information under statutory reporting be licensed Creative Commons CC-BY-4.0

2 Standing

We submitters are part of an open energy modelling community and allied research communities and many of us participate in the [Open Energy Modelling Initiative](#) (see section 2.2). The Initiative itself is a network of individuals and is not incorporated under law. Our [mailing list](#), established in October 2014, now numbers over 800 and our [discussion forum](#) over 700. The majority of participants reside in Europe.

The Open Energy Modelling Initiative has no process for canvassing and endorsing policy positions. Nor has it legal standing. So while some of the material in this submission was discussed on Initiative forums, the views expressed here are solely those of the named submitters. The European Commission classified us as an “informal organisation” for the purposes of previous submissions in 2017 and 2020.

2.1 Submitters

Background on the individual submitters, their affiliations, and the open projects (with hyperlinks) they contribute to, as follows:³

¹ The United Kingdom-based Open Knowledge Foundation (OKF) act as the licence steward for data-capable open licenses and adjudicates on conformance with its Open Definition 2.1.

² This practice of copyright assignment no doubt falls outside of the scope of a Data Act, but is nonetheless something that the Commission should examine and remedy in the context of open science policy.

³ One submitter is resident outside the European Union. This is acceptable under Commission consultation guidelines.

- [< personal bios suppressed during development >](#)
- [< personal bios suppressed during development >](#)
- [< personal bios suppressed during development >](#)
- Robbie Morrison, Berlin, Germany: former maintainer of the [deeco](#) high-resolution model and contributor to the open energy modelling community.

2.2 Open Energy Modelling Initiative

As indicated, the Open Energy Modelling Initiative, shortened to “openmod”, is an informal network of energy system modellers and analysts committed to open source software, genuinely open data, open science, and open policy analysis. The openmod was established six years ago in Berlin primarily by German researchers together with researchers from Denmark, Austria, and Switzerland. The community is now active in the United States and Canada, with interest from India, Africa, South America, eastern Europe, and Russia, and more latterly the United Kingdom. The openmod works solely in english although its first meeting in September 2014 was conducted in German.

The Initiative has held 13 workshops in Europe and elsewhere and these attract researchers, private sector modellers, and on occasion the interested public. The last physical meeting, pre-Covid, was held in Berlin in January 2020, spanned three days, and brought together 190 participants. Planning has begun for the next physical workshop, contingent on pandemic control measures being relaxed sufficiently.

As indicated, the openmod does not endorse individual projects, nor does it form and advocate policy positions. This being an unwritten but nonetheless negotiated community norm ([Morrison 2019](#)). This submission is therefore solely in the name of the listed submitters.

3 Legal issues

This section looks at some of the legal issues that we believe should be expressly traversed and resolved where possible. This section works from the more specific to the more general. Some of the suggestions below may well be rendered unnecessary if the Commission decides to address the informing concerns at a deeper level.

3.1 Specific legal points

1. a determination on whether human authorship is a necessary condition for copyright
2. a determination on whether the machine processing of a legitimately held copy of a collection of atomic data under copyright constitutes civil or criminal infringement
3. improve legislative support for the dedication of information to the public domain or some equivalent status
4. amend the 96/9/EC Database Directive to better reflect the intention of lawmakers regarding thresholds and scope and provide guidance on what constitutes “substantial investment” and “substantial extraction” and how that information should be transmitted to users
5. revise the statutory definition for “reuse” provided in the 2019/1024 Open Data Directive (§2.11) — currently and perversely remapped to “use” — so as to provide a definition consistent with the remainder of that statute, including recital 16, and its title and intent⁴

⁴ Both spellings of “reuse” and “re-use” appear in Commission documents. This submission adopts the first variant.

6. either clarify or remove the term “primary owner of the data” from Regulation 534/2013 (§2.23) which covers the statutory reporting of electricity market information
7. explicitly waive 96/9/EC database protection by default on public sector information

We note the concept of a novel industrial property right (IPR) that the Commission was earlier pursuing seems to have fallen by the wayside (Stepanov 2020:80). 18

We also note that the notion of high-value datasets (HVDS), as given in the 1024/2019 Open Data Directive, does not include the energy sector. This issue was raised in 2020 (Morrison 2020) and should be revisited by the Commission. 19

3.2 Information under statutory reporting

The underlying problem is that the legislation that mandates statutory reporting was silent on licensing. Thus although the information is publicly available at some minimal level, it remains legally encumbered — or at least, potentially so. The main issue is the uncertain presence of 96/9/EC database protection (Hirth 2020:10). Giannopoulou (2018:5) reviews the status of 96/9/EC database rights in public sector information (PSI) and concludes there are good reasons to believe that no such protection applies. A careful reading of recital 41 of the Database Directive could easily arrive at the same view in regard to information under statutory reporting. Here are some relevant examples: 20

EXAMPLE The ENTSO-E Transparency Platform. The World Resources Institute (WRI) draw from the Transparency Platform to stock their Power Explorer portal and then offer that data under CC-BY-4.0. We understand ENTSO-E contacted WRI and were told that the Database Directive does not apply to servers operating from within the United States.

EXAMPLE EEX reporting. The European Electricity Exchange market operator serves statutory reporting in such a way that it can be viewed on screen but not copied, scrapped, or downloaded. In other words, that data is not recoverable or numerically usable. We have no idea if this practice is legally compliant or not, but it must certainly be counter to the spirit and intent of the legislation that mandates disclosure.

EXAMPLE OPSD portal. The OPSD project (see section 4.5) also serves data drawn from the Transparency Platform but is unable to apply CC-BY-4.0 licensing for the reasons indicated in section 4.4.

Repeated attempts within our community to liaise with the EEX market operator have so far yielded nothing substantive. It would appear that their policy is to release as little information as possible under the most restrictive conditions possible. 21

Turning to data longevity, European Commission Regulation 543/2013 states (3§1) (European Commission 2013) (emphasis added): 22

“The data shall be up to date, easily accessible, downloadable and available for **at least five years**. Data updates shall be time-stamped, archived and made available to the public.”

So after five years, datasets hosted by ENTSO-E could go dark and there is little or nothing that energy system analysts could do about that under present conditions. 23

3.3 Business-to-government (B2G) information publication

Our community has begun to consider the option of obtaining key metrics via mandate, suitably aggregated, anonymized where necessary, and made public under suitable open licensing. Indeed, we recently 24

wrote the following in a community interview ([Cooper 2021](#)):

“Cost information is necessarily estimated in most cases because this information is normally commercially sensitive. Notwithstanding, the European Commission, as well as other governing agencies around the world, could collect cost and performance information under a public interest rationale and make key metrics available in generic form. Future costs and performance projections, which can also be subject to technological learning, are necessarily speculative.”

This is a topic covered extensively in a High-Level Expert Group on B2G report ([HLEG on B2G 2020](#)) which also makes a number of references to “aggregated, anonymized” information. Notwithstanding, the authors barely mention energy and decarbonization data in this exercise. Indeed, it seems that our domain is not much considered when investigating this kind of reporting (nor for HVDS for that matter).

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3.4 Incumbent databases

We use the term “incumbent database” to describe databases developed in a regulatory context that are not made available to independent researchers under explicit open licensing.

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EXAMPLE PEMMDB database. The Pan-European Market Model Database (PEMMDB) is not accessible as best we can determine.⁵ Moreover, results using this particular database are often quoted in presentations aimed at influencing public policy. And yet independent researchers cannot gain access. The United Kingdom CLEARHEADS project would like to connect but has been unable to do so.

We view the practice of incumbent databases as deficient, an inefficient use of public resources, and counter to the norms of both science and public policy development.

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3.5 Artificial intelligence

Some in our community work with artificial intelligence methods. Notwithstanding, the focus of this submission is on primary data. That is also the kind of data that would also normally be used to create training sets.

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3.6 License choice and license compatibility

The debate on choice of license rarely looks at the question of legal interoperability. Rather, the merits of individual classes of license are debated and then the merits of individual licenses. This same discussion takes place within our community too. But this approach tackles the problem from the wrong end. Instead, licence interoperability must be a paramount consideration. For background, please see:

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- [Which open data license](#)

[< needs work based on content in the aforementioned blog on license choice >](#)

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3.7 Limited relevance

For completeness, the following topics are of limited relevance to our community. The bulk of proposed measures in the inception report are aimed at improving business-to-business (B2B) flows while simultaneously protecting private communications or promoting fairness in regards access to B2B information

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⁵ The ENTSO-E legal department was contacted on this matter on 11 June 2021 and that appears to be the correct status.

and participation in nascent digital markets.

4 Data management within our domain

This section describes some relevant themes that arise from within our domain. 32

4.1 Paradigm shift

The paradigm shift in data management that is occurring is essentially from local to domain-wide. The idea of local, as used here, extends to databases accessible from the web. 33

The threads listed below provide further background. The second in the list summarises a range of domain-wide projects and could well be of interest to the Commission. 34

- [Data standard for energy system modelling](#)
- [Domain-wide data projects](#)

< needs work and a table or diagram but that material will not change the thrust of the submission > 35

4.2 Semantics

The community is currently developing an Open Energy Ontology (OEO) ([Booshehri et al 2021](#)). That particular effort could have built on earlier scientific work but was prevented from doing so due to the lack of a suitable open license, as follows: 36

EXAMPLE The EnArgus ontology. The EnArgus ontology was developed with German public funding to support public decision-makers but remains proprietary nonetheless ([Booshehri et al 2021:10](#)). As a result, none of the substantial work invested could be recycled by the OEO project, thus causing both delays and expense that our society can ill afford at present.

It is worth noting too that similar work on ontologies is being undertaken by the smart systems community under the rubric of “digital twins”. Our community informally coordinates with these efforts via the Linux Foundation LF Energy data architecture working group. 37

4.3 Metadata

Metadata policy and practices are being pursued by the EERAdata metadata project ([Wierling et al under review](#)). This initiative covers non-open data and extends well beyond our community. The details of that project are not relevant here but what is notable is that the process strives to be necessarily inclusive and consensus-based. 38

4.4 Interacting with statutory entities

Members of the Open Energy Modelling Initiative have been interacting with ENTSO-E for quite some time. For instance, this thread was initiated in October 2017 and explores various opportunities for cooperation: 39

- [Cooperating with ENTSO-E on data](#)

We understand that ENTSO-E is committed to open data but that they are a membership-driven organisation and that all members would need to consent to a policy of CC-BY-4.0 licensing before embarking on such. The alternative is, of course, that the European Union mandate such licensing. And after four years of engagement with no apparent movement, that is exactly what we are asking the Commission to propose. 40

All attempts within our community to engage with the EEX electricity market operator (also known as 41

power exchanges) have to date proved fruitless. Again, mandating suitable open licensing would seem the most sensible path forward.

4.5 Examples of good practice

An example of good practice is the recently released database of European energy storage technologies and facilities. The database is published on the data.europa.eu portal under CC-BY-4.0 licensing and accompanied by documentation.

- [announcement posting on the Open Energy Modelling Initiative forum](#)
- [Database of the European energy storage technologies and facilities](#)

The [Open Power System Database](#) (OPSD) is another example of good practice ([Wiese et al 2019](#)). The OPSD draws from ENTSO-E Transparency Platform, curates that material in a transparent, reproducible, and open fashion, and then publishes it for use by researchers and others. The legal context of the datasets served remains nonetheless grey.

The German BNetzA [SMARD](#) site also source from the Transparency Platform, but then licenses the data served under CC-BY-4.0.⁶

The Wikipedia article on [open energy system databases](#) may be worth reviewing too.

Finally, the Commission could consider transferring and cleaning material from the ENTSO-E Transparency Platform and EEX reporting to the data.europa.eu portal for reasons of access, persistence, and licensing.

4.6 Community curation

The paradigm shift mentioned earlier (see section 4.1) is as much social as it is technical. And one of the consequences is a growing sense that the community “owns” the data it collects and uses.

In that regard, the OPSD is an example of a conventional portal. But as indicated, the OPSD has invested considerable effort in cleaning datasets sourced from the ENTSO-E Transparency Platform.⁷

EXAMPLE Power plant lists. Obtaining a list of power plants in Europe has proved difficult. Indeed researchers have had to source lists from several sources and then algorithmically identify the least inconsistent combination ([Gotzens et al 2019](#)). There surely has to be a better way.

This forum thread providing further background:

- [Lists of power plants](#)

Several projects, many of which derive from the United States, have been assembling coherent and complete datasets specifically for energy system modelling purposes. These projects are more than databases or portals — they contain sophisticated code to check the integrity and completeness of the inventory, can perform basic calculations, provide interfaces with various model frameworks, provide standardised reporting, and more.⁸ US-based projects include [PowerGenome](#), [PowerSystems.jl](#) and its associated data

⁶ BNetzA does so on a basis of a legal opinion. One of the submitters requested a copy of that opinion but was politely turned down. The overarching message here is, once again, is that the current statutory context is inconsistent and unsatisfactory.

⁷ We understand that some member organisations return spreadsheets to the Transparency Platform via email with unilaterally altered column identifiers.

⁸ The term “model framework” is used within our community to separate the underlying application software from specific instances of that application that have been populated with data. These instances are then generally known as “models” and a specific model may then be used to run any number of exploratory “scenarios”. These scenarios are then interpreted relative to some stated “reference case” scenario, often but not necessarily some expression of business-as-usual.

libraries, and the [Open Energy Outlook](#) database. The [Spine Toolbox](#) from Finland represents another example.

To reinforce the point being made, these new domain-specific “data systems” provide joined-up data that can service any number of projects and modelling teams working within the same local, national, or regional scope. Moreover, these data systems encourage cooperation on the collection and maintenance of the assembled information and enable cross-model comparisons. We cannot help but speculate that most of these developments originated in the United States because the bulk of their energy sector data is legally unencumbered.⁹ Or conversely in Europe, very little of this effort is legally possible without the primary data being first released under CC-BY-4.0 licensing.

Another community resource, more technical than informational, is the [Open Energy Platform \(OEP\)](#).¹⁰ The OEP offers backend services to energy modelling teams and can be used to define and host framework-independent scenario sets for use across any number of projects ([Reder et al 2019](#)).

4.7 Looking forward

It can be expected that some of the themes articulated in the submission will continue. Speculatively:

- that data is increasingly viewed and treated as a domain-wide common pool resource
- the shift from classical schemas to semantic triples graphs with embedded datasets will continue
- parallel work on a community-agreed ontology and on metadata practices will continue
- the ethos of open science and open policy analysis gains ground, be it for ethics or pragmatics
- conversely, non-open science and non-open policy analysis becomes increasing untenable

5 Discussion

We wish to underscore again how debilitating it is to not have good access to public-interest datasets licensed under CC-BY-4.0.

We highlight again the need to fully decarbonize our energy systems in three short decades. Indeed, energy systems, broadly defined, may well need to be substantially net-negative in order to permit emissions from other hard-to-decarbonize sectors such as agriculture.

We note that generally the system operators have been much easier to engage with than the market operators. And reiterate the point about the EEX serving statutory information in formats that are viewable but not recoverable or numerically usable.

Furthermore, to reinforce that much of the information available is in relatively poor state and often lacks provenance.

The Commission should not simply introduce a new Data Act, but also take the opportunity to repair other statutes including the 1024/2019 Open Data Directive as indicated earlier.

The submitters would be happy to provide the Commission with further information, sources, and examples on request. And many in our community would doubtless be willing to engage with the Commission and explain trends, expand on their experiences, and/or discuss their research interests in the context of open data and open science.

⁹ Work produced by federal employees is automatically public domain, datasets lacking creative input are not subject to copyright, and there has never been explicit database protection.

¹⁰ The Open Energy Platform is not to be confused with a energy sector data brokerage service with a similar name being developed by UK-based Icebreaker One.

Acknowledgements

The submitters wish to thank Jane Doe for their input. John Doe kindly proofread a final version. All errors remain the responsibility of the submitters.

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The document itself was prepared using free software (Linux, bash, git, LaTeX, Inkscape) and open fonts.

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Abbreviations

| | |
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| API | application programming interface |
| B2G | business-to-government information flows |
| EEX | European Electricity Exchange |
| ENTSO-E | European Network of Transmission System Operators for Electricity |
| IDR | industrial data right (speculative) |
| HVDS | high-value dataset (European Commission 2019) |
| ICT | information and communications technology |
| ODD | 2019/1024 Open Data Directive (European Commission 2019) |
| OEP | Open Energy Platform |
| openmod | Open Energy Modelling Initiative |
| PEMMDB | Pan-European Market Model Database |
| PSI | public sector information |
| SPDX | software package data exchange |
| TP | European electricity market transparency platform (ENTSO-E 2017) |
| TSO | transmission system operator |
| UrhG | <i>Urheberrechtsgesetz</i> (the German statute covering copyright) |
| WRI | World Resources Institute |

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