

Legal Barriers and Open Issues for an Effective Implementation of AV in Austria

Dragana Damjanovic, LL.M. (Berkeley)¹ and Dominik Wagner¹

¹ Research Unit of Law, Institute of Spatial Planning, TU Wien, Austria

Abstract. Agrivoltaics (AV) represents a valuable alternative to solve the conflict between the expansion of renewable energy and land consumption in the course of the energy transition. Although the Austrian Renewable Energy Expansion Act (EAG) and accompanying regulations contain some provisions on the eligibility of AV under the national support scheme for renewable energy, the other areas of law affected by AV have not yet been adapted accordingly. In particular, there is a lack of appropriate zoning types in the spatial planning acts of the Länder that could promote multiple uses of land for AV. This results in an unsatisfactory legal framework that poses numerous legal problems for the implementation of AV in Austria. To ensure the long-term implementation of AV, the Austrian legal framework must therefore be adapted accordingly, especially with regard to the creation of suitable zoning types, which take into account various aspects, such as energy production, domestic agricultural production, landscape integration and social acceptance. In the course of this process, questions of competence between the federal government and the Länder will play a decisive role.

Keywords: AV Implementation Austria, Spatial Planning Law, Multiple Land Use

1. Introduction

In Austria, Agrivoltaics (AV) has not yet been implemented on a market basis. One reason is the highly unclear legal basis for the implementation of AV. So far, only experimental plants on a smaller scale exist, e.g. the pilot plant in Guntramsdorf – Lower Austria operated by Wien Energie [1] or the ‘Öko-Solar-Biotop’ in Pöchlarn – Lower Austria [2]. An interdisciplinary project called PlusIQ [3] (including experts from the field of PV-engineering, plant growth and health, micro-climatic meteorology, soil science, legal science, digital agriculture and informatics, landscape planning, cultural heritage studies and architecture) aims to establish a further pilot plant in a real-world environment (i.e. at the castle Heiligenkreuz-Gutenbrunn in Lower Austria), with the intention to examine the various aspects relevant for AV implementation in Austria [4]. In addition to agricultural, technical and socio-economic aspects these are particularly legal aspects.

This paper will give an overview on the current legal framework for AV in Austria and the legal issues that arise with regard to implementing AV, both on an experimental basis (i.e. for research purposes) as well as on a long-term market basis (i.e. for economic purposes). Following this, we will share initial thoughts on necessary adaptations of the rules, in order to realise a proper legal framework for AV. An improved legal framework for AV should allow a degree of legal certainty for farmers, investors and project developers. It would also contribute to the expansion of renewable energies, while at the same time protecting domestic agricultural production as well as solving landscape integration and social acceptance concerns.

2. Agrivoltaics – Relevant Fields of Law

AV technology cuts across a whole range of regulatory matters and thus raises various legal questions. As far as regulatory matters of the Länder in Austria are concerned, we refer throughout to the Law of Lower Austria, as the planned pilot plant of the project PlusIQ shall also be located in Lower Austria.

Spatial Planning Law is a central legal field in relation to the implementation of AV. It stipulates how land may be used and at the same time excludes certain other uses. The implementation of AV areas zoned for agricultural use are particularly relevant as AV would enable agricultural production and the production of solar energy on the same area. In Austria, the use of agricultural land is specifically protected by the designation of areas as agricultural priority areas (landwirtschaftliche Vorrangzonen) [5, pp. 143ff]. Thus, a central legal question is whether, to what extent and under what conditions land zoned for agricultural production can be used for the production of solar energy.

Beyond Spatial Planning Law, the question also applies to the wide field of Agricultural Law, including agricultural aid policies. First, disposals of agricultural land and the transfers of ownership is usually subject to an authorization from the public authorities. In Lower Austria this authorization regime is laid down in the Land Transaction Act of Lower Austria (NÖ GVG 2007). As these rules aim to protect both the existence of peasant structures and peasant economy, as well as agricultural land and sustainable local food production [6], they might become obstacles to the involvement of investors and players of the energy market in larger AV projects. The issue depends on how these rules will be applied by the responsible authorities when it comes to transactions of land to implement AV technology. Qualitative soil protection measures (e.g. on the use of pesticides) might also have an effect on the implementation of AV. Then again, agricultural subsidies are linked to the agricultural use of the land. So, the use of the land for electricity production could come into conflict with the eligibility requirements for agricultural aid. This would have to be examined in detail both under the EU direct payments provisions [7] and the respective national programmes [8]. There are, however, good arguments for farmers being able to receive agricultural aid in line with the respective support programmes [9, p. 55] as long as AV technology does not restrict agricultural use of the land extensively, i.e. as long as the energy production does not overshadow the agricultural production. Yet again, another example in the wider context of Agricultural Law is hail insurance – and the legal questions that arise on whether and how the construction of an AV plant might affect the relevant insurance policies and cover.

Since PV systems are physical structures, Construction Law has to be considered too. Construction Law in Austria – like Spatial Planning, and to a great extent also Agricultural Law – is a competence of the Länder. In Lower Austria, PV systems up to 1 MW_{peak} principally require a building permit (see § 1 (3) 4 Building Act of Lower Austria - NÖ BO 2014), except if they are installed in urban areas (§ 17 NÖ BO 2014) which is however typically not the case with AV as they are to be constructed in rural rather than urban areas. Moreover, larger PV systems with more than 1 MW_{peak} anyway need a permit according to the Electricity Act of Lower Austria (§ 5 (2) 3 NÖ EIWG 2005). Interestingly, regardless of their size, these PV structures do not need a permit under the Austrian Environmental Impact Assessment Act (UVP-G). This is contrary to the legal situation in other European countries, including Greece, Portugal, Romania, Spain, or Germany, which require an EIA for a ground-mounted PV system above a certain threshold. The compatibility of the legal situation in Austria with EU law appears questionable [10].

Finally, in addition to the provisions on the installation of the plant, the grid access regime of Electricity Law must be taken into account if the electricity produced by AV is to be fed into the grid. Furthermore, the provisions of the Austrian Renewable Energy Expansion Act (EAG), which was only issued in October 2021, must be considered to receive aid for the production of renewable energy from the national support scheme. It is notable that the Federal

Act explicitly mentions AV as "Agri-PV" [11]. On this basis, in April 2022, the Federal Minister of Climate Action, Environment, Energy, Mobility, Innovation and Technology defined additional requirements for AV in a specific ordinance to this Act, the so called EAG Investment Subsidies Ordinance on Electricity (EAG-Investitionszuschüsseverordnung-Strom) [12]. These are: (i) main agricultural use and electricity production as a secondary use, (ii) even distribution of the PV modules over the entire surface and (iii) agricultural use of at least 75% of the total area for the production of plant or animal products.

So, the Austrian legal regime already provides quite a clear basis for receiving state support for the electricity production by AV, while not yet making clear whether – or under what conditions – AV technology might be established on a market basis at all.

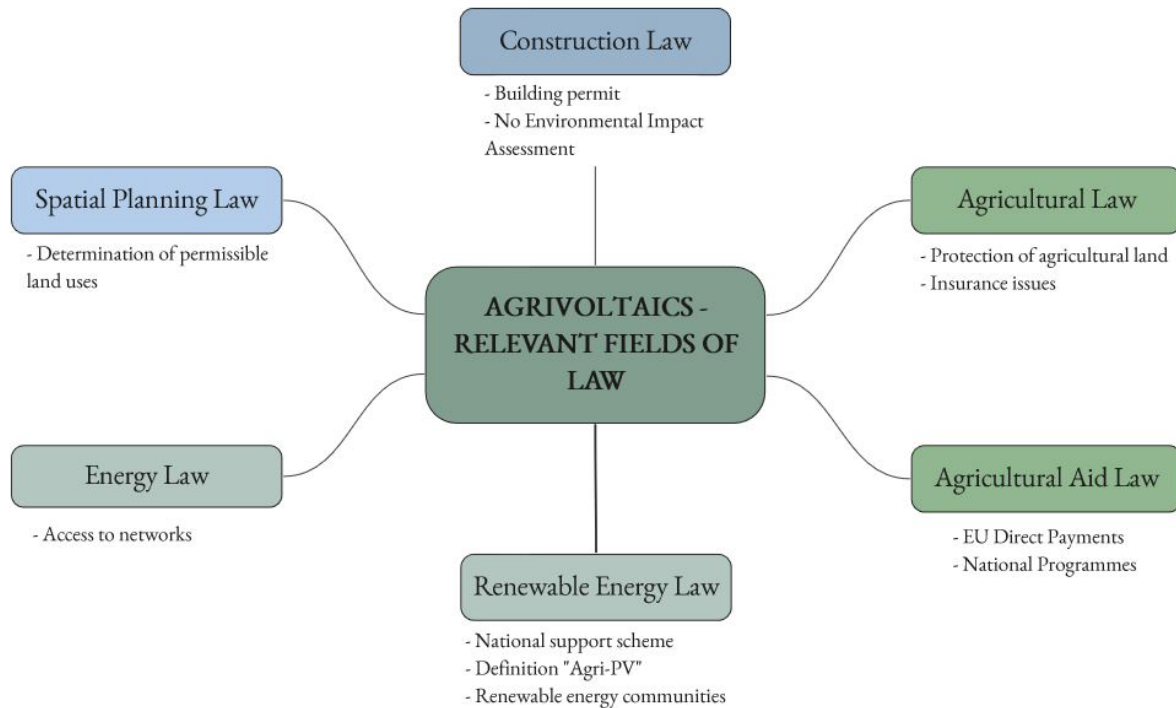


Figure 1. An Overview of the relevant fields of law with regard to AgriVoltaics.

3. AgriVoltaics – The Issue of Multiple Use of Agricultural Land

3.1 General Principle of Single-use Zoning and Possible Exemptions

In this section we focus on the core legal issue of how land zoned for agriculture might be used in multiple ways, i.e. for energy production as well. We analyse this, for both the temporary installation of an AV plant for experimental purposes and for the long-term market provision of AV for economic purposes. An illustration of the legal issues is provided by the case study of the Plus IQ’s pilot plant.

The area around the castle Heiligenkreuz-Gutenbrunn, where the Plus IQ’s pilot plant shall be realised, is zoned as “Grassland – Agricultural and Forestry” under § 20 (2) 1a of the Spatial Planning Act of Lower Austria (NÖ ROG 2014). From this zoning it follows that the area may only be used for agricultural production and forestry. Under current law, multiple land uses for agricultural production and PV systems at the same time are typically not permitted. An experimentation clause – that allows multiple use for temporary or experimental purposes does not exist either. The current law provides only two exemptions from this general rule: First, it is allowed to install PV systems up to 50 kW in Grassland (§ 17 (14) NÖ BO 2014), which is

insignificant both for the purposes of the pilot plant and of course for the “normal operation” of AV. Secondly, physical structures “necessary” for agricultural use are permissible if they are sustainably managed (§ 20 (4) NÖ ROG 2014). Under this exemption, a farm shop or a storehouse for example can be constructed on agricultural land. It is, however, not yet clear, whether PV systems with more than 50 kW could be installed under this exemption clause since a case law on the concrete subject of AV does not yet exist. The case law so far regarding other physical structures suggests that there has to be a connection between the building and the so-called agricultural primary production to be qualified “necessary” under § 20 (4) NÖ ROG 2014. In 2021, the Lower Austrian Administrative Court ruled that the construction of a wind turbine on an area zoned as “Grassland – Nursery” cannot be considered “necessary” for the horticultural use of the land without demonstrating a concrete connection with the horticultural production carried out on the area concerned [13]. On the basis of this case law, it arguably makes a difference whether the electricity generated by the AV plant is directly used for agricultural production, consumed privately by the farmer or sold to the market. Furthermore, in the case of AV, the solar panels not only produce energy but also have positive effects on the plants due to the shade created, or protection against hail damage. Such benefits would contribute to another argument that the structures are indeed necessary for agricultural use [14]. It seems that compared to Austria, the German case law already provides clearer guidance on this topic. The German Federal Administrative Court, for instance, considers the use of approximately two thirds of the electricity generated by a wind turbine for agricultural operations as sufficient [15]. As long as the legal provisions in Austria offer too much leeway for interpretation and as long as the courts have not made a decision on the specific topic of AV, the resulting uncertainty acts as a barrier for the successful implementation of AV.

3.2 On the Re-Zoning of Agricultural Land to Enable AV

Due to these legal uncertainties, in the course of the Plus IQ project a re-zoning of the test area originally zoned as “Grassland – Agricultural and Forestry” to “Grassland – PV systems” has been arranged with the municipality in order to allow for the realisation of the pilot plant. “Grassland – PV systems” is a specific zoning type according to § 20 (21) NÖ ROG 2014 that permits the installation of ground-mounted PV systems with more than 50 kW in open land. Other existing experimental plants in Austria are also realised on land that is not zoned as agricultural land but as land for industrial uses. In these areas, dual use of land for solar energy and agriculture production is not problematic, as areas zoned for industry or building might of course also be used for agriculture. These areas are, however, generally not suitable for a high quality agricultural production. Establishing AV on areas for industrial use thus cannot be the solution for a large-scale implementation.

Above, in the case of the land at the castle Heiligenkreuz-Gutenbrunn the re-zoning was only possible due to the low soil quality of the affected land. If the soil quality had been higher, the municipality would not have been able to re-zone this agricultural land as easily because of the specific protection measures for agricultural land of high quality.

The chosen path for the pilot plant – simply re-zoning agricultural land to “Grassland – PV systems” – cannot in any way be the answer to the legal issues for long term implementation of AV in Austria. The zoning type “Grassland – PV systems” cannot ensure the continuation of agricultural production, as it does not take agricultural aspects into account at all. Thus, the approach simply to re-zone to enable AV cannot adequately resolve the tension between the necessary expansion of renewable energies and the increasing importance of domestic agricultural production. The incompatibility raises serious issues regarding the loss of agricultural land.

3.3 Contractual Agreements - Vertragsraumordnung

One could think of the instrument of contractual agreements between the municipality and the landowner to oblige the landowner to continue to use the land for agricultural purposes next to

energy production. But the use of contracts in spatial planning (Vertragsraumordnung) to such a great extent gives reason for doubt under Austrian Constitutional Law [16, pp. 89]. Furthermore, the validity and enforcement of such contracts under Austrian Private Law raises open issues [16, pp 103]. Despite the use of contracts, re-zoning would under the current legal regime nevertheless lead to a loss of control by the public hand, as all the other provisions safeguarding the existence of agricultural land, e.g. the Land Transaction Act of Lower Austria (NÖ GVG 2007), would not apply anymore (because they only apply to land zoned as agricultural land). The re-zoning might have an impact on the applicability of other areas of law as well, such as tax law or agricultural subsidies, and consequently lead to confusion and inconsistencies.

4. Initial Thoughts on Necessary Adaptations of the Austrian Legal Framework

The current legal framework in Austria already acknowledges the major role of the expansion of renewable energies and defines corresponding targets. At the federal level, the government intends to increase the current installed PV capacity of 1.6 GW to 13 GW in the next ten years [17]. Corresponding goals are laid down in § 4 EAG. At the level of the Länder, § 1 (2) b of the Spatial Planning Act of Lower Austria for example defines the expansion of renewable energy production as a general guiding objective of spatial planning activities [18, p. 53]. To meet the defined targets, PV must also be installed on open land as rooftop PV capacity alone would not suffice [19, p. 13]. It is nevertheless difficult to make full use of these resources due to economic and legal structures [20, p. 60]. Given that land is scarce and land consumption has to be reduced in general [5], [20, p. 61], the dual use of agricultural land via AV technologies is likely to become an important element in the course of energy transition.

Despite the defined goals and potential of AV, the current legal framework does not yet provide a clear basis for the long-term implementation of AV in Austria: The EAG, which at least refers to AV, contains only rules on the subsidisation of this technology. The Spatial Planning Acts of the Länder do not yet provide for appropriate zoning types to enable multiple land use. Other fields of law, such as Agricultural Law, are also not yet adjusted to the deployment of AV. Comprehensive approaches (and definitions) relating to AV also do not exist, therefore there are no established standards for this technology on which the approval authorities could build upon. In contrast, in other European countries, certain terminological definitions and/or eligibility criteria for AV have already been established. In 2021, the Agence de la transition écologique (ADEME) published a guide of AV classification with the title 'Caractériser les projets photovoltaïques sur terrains agricoles et l'agrivoltaïsme' for France [21]. In Germany, the Deutsche Institut für Normung (DIN) published the standard DIN SPEC 91434:2021-05 on AV in 2021 [22]. The aim of this document is to propose a standard for permission procedures for AV systems, including certain AV metrics, that authorities may use for approvals in the future. Another important aspect of setting minimal requirements in the DIN SPEC is to minimise the misuse of AV systems. Both documents – the French and the German – were developed in collaboration with experts on AV.

4.1 Introduction of a New Zoning Type “Grassland – Agrivoltaics”

To facilitate the implementation of AV on a larger scale, it is of utmost importance that Spatial Planning Law allows for appropriate zoning of areas for AV use. This can be achieved by the introduction of a new zoning type “Grassland – Agrivoltaics” in the Spatial Planning Acts of the Länder, or by adapting the existing zoning types, e.g. “Grassland – Agriculture and Forestry” accordingly. In this context it is valuable to mention that the EU Commission emphasises the importance of multiple land uses – especially with regard to AV – in its EU Solar Energy Strategy published on 18 May 2022 [23].

The creation of a new zoning type and the definition of new standards for this new technology has of course to be complemented by rules which lay down the criteria by which the relevant authorities (the Länder governments and/or municipalities) decide which areas to consider for AV, i.e. when drawing up the concrete zoning maps. These criteria should consider all the relevant aspects of AV: the safeguarding of soil quality and agricultural production; the potentials of energy production and landscape protection as well as social acceptance. Ideally, these criteria would be developed in close cooperation with the relevant scientific disciplines and experts on AV. In addition to substantial rules, procedural provisions could improve the quality of the planning outcomes by ensuring a high quality of administrative reasoning, promoting proper public participation and thus social acceptance.

4.2 Role of the Federal Legislator

Although in Austria the Länder are primarily responsible for spatial planning according to the Austrian Constitution (B-VG), one could also think of measures at a federal level in order to accelerate the implementation of AV. Legal acts could be enacted on the competence of the federal legislator for electricity under Art 12 (1) 2 B-VG. It can be argued that this competence to some extent also includes spatial planning issues related to the organisation of the national electricity infrastructure [20, p. 52], [24]. While the concrete (local) zoning remains the responsibility of the Länder and municipalities, the federal legislator may lay down fundamental planning principles that the Länder must consider when zoning for AV. Upon this basis it could for example generally allow the construction of AV on agricultural land and thus abolish the existing restrictions resulting from the current spatial planning regulations of the Länder. Of course, such an approach must, again, leave sufficient leeway to the Länder to determine the criteria under which the construction of AV on agricultural land can be approved in a concrete case.

Most recently, in May 2022, the EU Commission made it clear in its proposal for an amendment of the Renewable Energy Directive [25] that time is pressing when it comes to a faster deployment of renewable energies. In particular, the envisaged provisions on so-called “go-to-areas”, in which administrative (permit-granting) procedures for individual renewable energy projects are to be “streamlined” and accelerated, demonstrate the pivotal importance of spatial planning aspects in the course of the energy transition. The Plus IQ project will arguably contribute to the deployment of the necessary rules in Austria for AV, particularly through the close cooperation with experts from all relevant scientific disciplines.

Data availability statement

The relevant legal norms and legislative materials can be freely accessed under <https://ris.bka.gv.at/>.

Author contributions

Dragana Damjanovic: Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing – original draft, Writing – review & editing.

Dominik Wagner: Conceptualization, Investigation, Methodology, Project administration, Resources, Visualization, Writing – original draft, Writing – review & editing.

Competing interests

The authors declare that they have no competing interests.

Funding

This article is a result of research conducted as part of the project "PlusIQ – Agrarphotovoltaik: Integration als Weg zum Plus-Energie-Quartier", and received funding from the Austrian Research Promotion Agency (FFG), Project-No: FO999887012.

References

1. Wien Energie. Mit Agrophotovoltaik Synergien schaffen. <https://positionen.wienenergie.at/projekte/strom/agro-pv/> (4 July 2022).
2. RWA. Öo-Solar-Biotop Pöchlarn: Biodiversität und Photovoltaik vereint auf einer Fläche. <https://www.rwa.at/oeko-solar-biotop-poechlarn-biodiversitaet-und-photovoltaik-vereint-auf-einer-flaeche+2500+1014863> (4 July 2022).
3. This Project is funded by the Austrian Research Promotion Agency (FFG), Project-No: FO999887012 and is designed as a preliminary study for the construction of an AV pilot plant in Lower Austria.
4. Above all to communicate the results to a wider audience, especially the local population and farmers interested in introducing AV technologies on their land.
5. Holzer, "Bodenverbrauch – Raumplanungsrechtliche Aspekte", in Jahrbuch Agrarrecht 2016, Vienna, Austria: NWV, 2016, pp. 131-153.
6. Cf. § 1 and § 4 NÖ GVG 2007.
7. Cf. EU Regulation 1307/2013 on rules for direct payments to farmers and EU Regulation 1305/2013 on support for rural development; under the EU's new Common Agricultural Policy, these EU Regulations will be repealed by EU Regulation 2021/2115, which will generally apply from 1 January 2023; already addressed by Fraunhofer ISE, Agri-Photovoltaik: Chance für Landwirtschaft und Energiewende (April 2022).
8. One example is the Austrian Programme for Environmentally Sound Agriculture ('Österreichisches Programm für umweltgerechte Landwirtschaft' - ÖPUL). For more information, see <https://www.lko.at/%C3%B6pul-2023-ein-%C3%BCberblick+2400+3563571> (4 July 2022).
9. Fraunhofer ISE, "Agri-Photovoltaik: Chance für Landwirtschaft und Energiewende. Ein Leitfaden für Deutschland", Freiburg, Germany, 2022. https://www.ise.fraunhofer.de/content/dam/ise/de/documents/publications/studies/AP_V-Leitfaden.pdf (4 July 2022)
10. Ökobüro, "UVP-Pflicht für Photovoltaik-Freiflächenanlagen", Vienna, Austria, 2021. https://www.oekobuero.at/files/582/positionspapier_pv-schwellenwerte_05-2021_final.pdf (4 July 2022).
11. The EAG's specific provisions on AV were included only at the very end of the legislative process in parliament. Thus, the preparatory documents for the EAG do not contain any statements on the subject of AV.
12. § 6 (3) EAG-Investitionszuschüsseverordnung-Strom.
13. Administrative Court of Lower Austria (Landesverwaltungsgericht Niederösterreich – LVwG NÖ) 2.6.2021, LVwG-AV-1090/004-2019.
14. For the legal situation in Germany, see [9, pp. 56-57]
15. Federal Administrative Court of Germany, (Bundesverwaltungsgericht – BverwG), 4.11.2008, Az. 4 B 44.08; cited according to [9, p. 56].
16. Berka, Kletecka, "Gutachten zu Rechtsfragen der Vertragsraumordnung in Österreich", in ÖROK, Beiträge der Raumordnung zur Unterstützung leistbaren Wohnens, Vienna, Austria: 2014.
17. Federal Chancellery Republic of Austria, "Out of a Sense of Responsibility for Austria. Government Programme 2020-2024", Vienna, Austria, 2020.
18. Hofmann, "Zulässigkeit von Photovoltaik-Anlagen". RFG, 2, pp. 52-57. 2021.
19. Mikovits, Schuppenlehner, Scherhauser, Schmidt, Schmalzl, Dworzak, Hampl, Sposato, "A Spatially Highly Resolved Ground Mounted and Rooftop Potential Analysis

- for Photovoltaics in Austria". ISPRS Int. J. Geo-Inf. 10, 418. 2021, <https://doi.org/10.3390/ijgi10060418>
20. Häusler, "Photovoltaik- und Windkraftanlagen ja, aber wo?". *Nachhaltigkeitsrecht* 2, pp. 50-61. 2022, <https://doi.org/10.33196/nr202201005001>
 21. ADEME. Caractériser les projets photovoltaïques sur terrains agricoles et l'agrivoltaïsme. <https://librairie.ademe.fr/energies-renouvelables-reseaux-et-stockage/4992-caracteriser-les-projets-photovoltaïques-sur-terrains-agricoles-et-l-agrivoltaïsme.html> (4 July 2022).
 22. DIN SPEC 91434:2021-05, Agri-Photovoltaik-Anlagen – Anforderungen an die landwirtschaftliche Hauptnutzung (Agri-photovoltaic systems – Requirements for primary agricultural use)
 23. EU Commission, EU Solar Energy Strategy, COM (2022) 221 final.
 24. Hauer, "§ 20 EIWOG", in Hauer/Oberndorfer, EIWOG – Elektrizitätswirtschafts- und -organisationsgesetz, Vienna, Austria: pro Libris, 2007.
 25. Proposal for a Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources, Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency, COM(2022) 222 final.