

Doctoral (PhD) Dissertation Abstract

**UNDERSTANDING THE FUTURE OF
ELECTROMOBILITY IN THE EU AND ASEAN:
A COMPARATIVE LEGAL PERSPECTIVE**

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I. Aims and Scope of the Dissertation

Europe is a region that experienced EV growth in the last ten years, particularly in Nordic countries. In the same year, China had a substantial increase in the sales of EVs, leading to a remarkable total of 2.3 million EVs throughout the country. China's significant expansion has established it as a prominent force in the worldwide EV industry. China accounted for 50% of global electric vehicle sales, including both hybrid and battery-powered cars. This achievement highlighted China's dedication to promoting the use of electric vehicles and decreasing its environmental impact. Conversely, the United States experienced a discernible decrease in EV sales in the later half of 2019. The sole significant deviation from this declining pattern occurred with introducing a fresh Tesla model, which temporarily elevated EV sales. The contrast between the two nations underscores China's assertive drive towards the widespread adoption of electric vehicles, whilst the American market exhibited indications of stalling despite the presence of Tesla.¹

The growth of the EV market in various regions is inseparable from the support of authorities through a legal framework that provides financial and non-financial incentives. In addition, climate targets to reduce emissions from the energy and transport sectors are also influencing authorities to boost the EV industry and public interest in purchasing EVs instead of fossil fuel-based vehicles. EV growth also cannot be separated from the commitment of countries and regions to control emissions under the UNFCCC. EU and US are Annex countries in the UNFCCC, while China is not an Annex country. However, China has ratified the UNFCCC following the Kyoto Protocol and the Paris Agreement.

For example, the EU has established a comprehensive set of nine regulations and directives specifically tailored to promote the expansion of the EV market in the region.² The legislative measures encompass rigorous pollution requirements, monetary incentives for manufacturers and consumers alike, and steps to construct infrastructure that would facilitate the extensive adoption of electric vehicles. China has implemented a bold strategy, marked by the implementation of assertive laws that provide significant financial support and rewards to encourage the adoption of EVs. The New Energy Vehicle Industry Development Plan has set an ambitious goal for 2020, with the objective of selling 5 million units. This plan showcases China's dedication to establishing itself as a prominent player in the EV industry and aligns with its overarching objective to decrease carbon emissions and address the issue of climate change. Similarly, the United States has adopted China's legislative strategy by introducing subsidies and incentives to encourage the expansion of EVs. These efforts aim to reduce the financial obstacles for consumers and promote the manufacturing and acquisition of EVs, facilitating the shift towards a more environmentally friendly transportation system.³ The EU, China, and the US demonstrate a shared acknowledgement of the vital importance of electric vehicles in attaining environmental objectives and fostering technological advancement in the automotive sector by implementing such laws.⁴

¹ Jamie Hamilton et al., 'Electric Vehicles', *Electric Vehicles: Setting a Course for 2030* (Deloitte University EMEA CVBA, 2020), 4–5.

² Mehmet Efe Biresselioglu, Melike Demirbag Kaplan, and Barbara Katharina Yilmaz, 'Electric Mobility in Europe: A Comprehensive Review of Motivators and Barriers in Decision Making Processes', *Transportation Research Part A: Policy and Practice* 109, no. October 2017 (2018): 1–13, <https://doi.org/10.1016/j.tra.2018.01.017>.

³ Tao Wang, 'Recharging China's Electric Vehicle Policy', *Carnegie-Tsinghua Center for Global Policy: Policy Outlook*, no. August (2013): 3.

⁴ Evanthia A. Nanaki, Spyros Kiartzis, and George A. Xydis, 'Are Only Demand-Based Policy Incentives Enough to Deploy Electromobility?', *Policy Studies* 0, no. 0 (2020): 4, <https://doi.org/10.1080/01442872.2020.1718072>.

In addition to China, Europe, and the USA being major EV producers and markets, another region is predicted to be an up-and-coming producer and market for EV growth. These countries are located in Southeast Asia, which is regionally organized under the ASEAN organisation. ASEAN member countries are the third largest trading partners for the EU after the USA and China.⁵ Therefore, the relationship between ASEAN and the EU is very politically and economically strategic. ASEAN predicted it will be a centre of EV production and market in 2040.⁶ Thus, ASEAN must adopt appropriate legal instruments to grow low-carbon vehicles.

Nevertheless, ASEAN demonstrates unique organisational traits in contrast to the EU. ASEAN operates on a consensus-based approach compared to the EU's system, which enforces conformity through directly applicable legislative instruments or requires the adoption of directives into national legislation. Consequently, the legal structure of ASEAN possesses a different degree of coercive authority to enforce consistent adherence across its member states. As a result, the obstacles and regulatory restrictions to the advancement and expansion of EVs in ASEAN are significantly more challenging to overcome. Each member state maintains considerable independence in determining its national policies, resulting in a diverse and varied regulatory environment. The region's diversity makes developing a unified strategy for promoting EVs is challenging. Moreover, mandatory instructions are necessary for the creation of shared norms and motivations that are essential for promoting the use of electric vehicles. The issues are worsened by the differing degrees of economic growth, infrastructure preparation, and policy priorities among ASEAN countries.⁷ Consequently, whilst the EU may utilise its legal instruments to promote coordinated advancement in the EV industry, ASEAN faces the challenge of managing a complicated interaction of individual countries' interests and capacities, which makes the goal of attaining universal EV expansion considerably more difficult.

Regional organisations such as the EU and ASEAN are crucial in building the electromobility ecosystem. The EU and ASEAN have a shared vision and goal regarding energy transition targets, namely in the advancement of electromobility. Nevertheless, their methodologies differ considerably from a legal perspective. This discrepancy is closely connected to the fundamental disparities in the structure of their legal and regulatory frameworks and their integration features. The EU's approach is distinguished by a solid and unified legal framework that guarantees consistency and adherence across its member states. This is accomplished by implementing binding regulations and directives that have universal application to all member states or require the enactment of national legislation following EU requirements. This framework enables a synchronised and standardised progress of electromobility throughout the region.

ASEAN, in contrast, functions based on a consensus-based model that emphasises voluntary cooperation and mutual agreement among its member states. This model exemplifies ASEAN's focus on upholding national sovereignty and accommodating various political and economic circumstances. As a result, the legal instruments of ASEAN possess a different level of enforceability than those of the EU, which results in a more fragmented approach to the development of electromobility. Member states have a significant amount of independence in creating their policies and regulations, which leads to a diverse environment. This diversity creates substantial difficulties in establishing a unified electromobility ecosystem.

⁵ Xavier Nuttin, 'The Future of EU - ASEAN Relations' (Directorate-General for External Policies, European Parliament, 2017), 25, <https://doi.org/10.2861/784770>.

⁶ Youngho Chang and Yanfei Li, 'Electric Vehicles and Energy Insecurity in ASEAN Countries: Renewable Energy Integration and Urban Air Quality' (Asian Development Bank Institute, 2019), 3, <https://www.adb.org/publications/electric-vehicles-energy-insecurity-asean-countries>.

⁷ Art. 288 European Union, 'Consolidated Version of The Treaty on The Functioning of The European Union', The Treaty on The Functioning of The European Union § (1957), http://data.europa.eu/eli/treaty/tfeu_2012/oj.

This study begins with the understanding that factual conditions related to electromobility occur in the EU and ASEAN. The EU and ASEAN are regional organisations with relatively similar characteristics regarding geography, history, legal system, governance system and climate change impacts. Geographically, both the EU and ASEAN member states are located on continental land, and there are also archipelago countries. The EU and ASEAN have historically experienced traumatic colonisation, increasing solidarity between nations. Historically, both organizations were born out of the need to promote peace and stability after periods of conflict. On the one hand, the EU emerged after World War II, with the aim of preventing further wars through economic integration. The trauma of NAZI occupation increased the solidarity of countries in Europe to prevent a repeat. ASEAN was established during the Cold War to promote regional stability and prevent the spread of communism, which later transitioned towards economic and socio-cultural cooperation. The trauma of colonialism by the British, French, Spain, Netherlands, USA, and Japan led to the establishment of ASEAN while maintaining the national sovereignty of each member state.

From a legal system standpoint, both the EU and ASEAN adopt treaties and accords as the foundational legal framework for regional cooperation. Both organisations provide structures that direct the collaboration of their member states. Nevertheless, the EU employs a binding supranational model, whilst ASEAN prioritises consensus and intergovernmental decision-making. Regarding the government system, the EU and ASEAN emphasise regional collaboration and institutional structures. Both organisations prioritise cooperation among member states via established institutions regulated by treaties or foundational charters. Nonetheless, significant distinctions exist, since the EU employs a supranational framework, whilst ASEAN emphasises intergovernmental consensus and principles of non-interference. Regarding climate change impacts, the two regions also experience similar conditions.

Despite having many similarities, the EU and ASEAN have different types of regional integration. Furthermore, this type has an impact on mitigating climate change impacts, such as reducing emissions at each member state's regional and national levels. It also includes the development of electromobility and the growth of EV adoption by the public. Therefore, there is a gap between the EU and ASEAN from the perspective of electromobility development and growth. There are two perspectives to examine the phenomenon. The first perspective is that the distinction in regional integration situations is a preference between strong and weak integration. The consequence of this perspective is that the EU and ASEAN are at two opposite and conflicting Polarities. Second, the difference in regional integration between the EU and ASEAN is a preference variation. Therefore, the form of integration adopted by the EU or ASEAN cannot be contradicted, and each variant has advantages and limitations. The advantages and limitations of each type of regional integration provide opportunities for cooperation between regional organisations.

Variations in the types of regional integration, especially in the political and legal contexts, influence the legal instruments adopted to regulate public affairs. The context of this research is to focus on the issue of electromobility to mitigate and address the impacts of climate change through the reduction of carbon emissions. Therefore, political and legal integration will influence the legal instruments adopted to regulate electromobility. Therefore, a comparative study between the EU and ASEAN from a legal perspective was conducted to understand the prospects for the development and growth of electromobility under variations in the modes of regional integration and the legal instruments adopted.

This research presents a comparative analysis of the role of the EU and ASEAN as regional organisations in regulating electromobility. As legal research, the primary source of documents to be studied is the legal instruments adopted by the EU and ASEAN. In addition, this research will also take references from books, articles in scientific journals, reports, and other relevant documents. Case law from various jurisdictions will also be referred to provide

a comprehensive understanding. However, there are several limitations the scope of this research. Firstly, the EU and ASEAN adopted the legal documents studied for directly regulating electromobility. Therefore, the scope of this research will expressly be limited to the legal instruments addressing climate change, renewable energy, energy efficiency, vehicle emissions, sustainable investment, and building performance. All of these six aspects have a significant direct influence on the development of electromobility.

Second, this research will analyse legal instruments adopted by the EU and ASEAN as regional organization. Therefore, if a description of legal instruments other than those in these jurisdictions is provided, it will only supplement the discussion and add the necessary information. However, this research will still utilise case law from other courts to provide a broader understanding of cases that may arise in electromobility. Third, to sharpen the analysis and discussion, this study will also discuss the laws and regulations on electromobility in EU and ASEAN member states. This study selectively chooses France, Germany, Hungary, and Poland as the EU member states to be discussed. The ASEAN member countries selected for this study are Indonesia, Singapore, Vietnam, and Laos.

II. Methodology

This legal research dissertation applies a comparative legal research method with a law-in-context approach. The consequence of using the comparative law method and law-in-context approach is that this dissertation must be separate from other methods and techniques but instead complement each other.⁸ Therefore, as legal research that interprets legal documents, this dissertation also involves legal doctrinal research methods, namely, interpreting legal texts, building legal arguments, and explaining the validity and relevance of logical and normative legal texts.⁹ In addition, this research will strengthen the argumentation by using statistical data, historical facts, and research results from other relevant disciplines.

The type of comparison used in this dissertation research is the comparison of laws and regulations in force between two legal systems (*de lege lata/de lege lata* comparison).¹⁰ This dissertation uses a comparative law research method to explain the differences and similarities between two legal models and contribute knowledge to them.¹¹ Operationally, this research was conducted using library research both online and in various libraries. Library research was conducted mainly at *Debreceni Egyetem Egyetemi és Nemzeti Könyvtár* (DEENK) or online by accessing databases provided on the website. Official EU legal documents are accessed through the website <https://eur-lex.europa.eu/>, and official ASEAN legal documents are accessed at <https://asean.org/legal-instruments-database/>. In the preliminary research conducted, it was found that not all ASEAN legal instruments are available on the organization's official website. Therefore, this research also uses an alternative legal database provided by the Centre for International Law, National University of Singapore (CIL NUS) through the website <https://cil.nus.edu.sg/database-cil/>.

⁸ Mark Van Hoecke, 'Methodology of Comparative Legal Research', *Law and Method*, 2016, 279–301, <https://doi.org/10.5553/rem/.000010>; Christian Von Bar, 'Comparative Law of Obligations: Methodology and Epistemology', in *Epistemology and Methodology of Comparative Law*, ed. Mark Van Hoecke (Oxford and Portland: Hart Publishing, 2004).

⁹ Mark Van Hoecke, *Methodologies of Legal Research, Which Kind of Method for What Kind of Discipline?*, ed. Mark Van Hoecke, *Methodologies of Legal Research*, vol. 9 (Oxford: Hart Publishing, 2014).

¹⁰ Juha Karhu, 'How to Make Comparable Things: Legal Engineering at the Service of Comparative Law', in *Epistemology and Methodology of Comparative Law*, ed. Mark Van Hoecke (Oxford and Portland: Hart Publishing, 2004), 80.

¹¹ Geoffrey Samuel, *An Introduction to Comparative Law Theory and Method* (Oxford and Portland: Hart Publishing, 2014), 45.

The research identifies the legal instruments the EU and ASEAN adopted to regulate electromobility. Subsequently, each legal instrument was analysed to learn its differences and similarities. The analysis at this stage sought to answer the first research question (Q1). The study was conducted doctrinally and comparatively by building logical normative arguments. Furthermore, to answer the second (Q2) and third (Q3) research questions, the theories of regional integration and hard and soft law in international organisation legal framework are applied. The analysis and discussion are conducted qualitatively by describing and evaluating each legal instrument on electromobility adopted by the EU and ASEAN.¹² The analysis stage will also contextualise the legal instruments in the factual conditions in the EU and ASEAN. Furthermore, the research will conclude and provide recommendations on the research results.

III. Hypothesis and Research Questions

This research will answer three main research questions to sharpen the research analysis. The problem formulations are as follows:

Q1: How did the EU and ASEAN electromobility legal framework develop?

Q2: How does variation in regional integration and choice of legal instruments affect electromobility development?

Q3: Does the legal framework of regional organisations such as the EU and ASEAN influence electromobility development in member states?

Based on the background of the study and the problem statement previously described, this dissertation builds the following hypotheses:

H1: The level of integration within regional international organisations influences the preferred legal instruments for regulating electromobility.

H2: The degree of bindingness of the preferred type of legal instruments adopted by regional organisations correlates with the development and growth of electromobility in member states.

IV. Structure of the Dissertation

This dissertation consists of six chapters. Chapter I, Introduction, addresses the research background, hypotheses, research questions, research methods, and dissertation structure. Chapter II centres on the theoretical framework, encompassing the precise definition of electromobility, the interrelation between climate change, energy transition, and electromobility, and the facets of energy justice and sustainability in electromobility. This chapter also explores the process of regional integration and the utilisation of obligatory and non-obligatory legislative tools within the legal structure of international organisations.

The development of electromobility in the EU and ASEAN will be addressed in Chapter III and Chapter IV. Each chapter will discuss the dynamics of energy policy at the regional level, the legal framework on electromobility, and the legal framework for electromobility in EU and ASEAN member states. Chapter V will discuss the significance and nexus between the EU and ASEAN legal frameworks on electromobility. This section will specifically discuss climate change mitigation and adaptation, cooperation between the EU and ASEAN and the role of regional organisations and their member states.

Chapter III and Chapter IV will discuss the progress of electromobility in the EU and ASEAN. Each chapter will analyse the dynamics of energy policy at the regional level, examine

¹² Ian Dobinson and Francis John, 'Qualitative Legal Research', in *Research Methods for Law*, ed. Mike McConville and Wing Hong Chui (Edinburgh: Edinburgh University Press, 2007).

the legal framework on electromobility, and explore the legal framework for electromobility in member states of the EU and the ASEAN. Chapter V will compare the EU and the ASEAN legal frameworks regarding electromobility. This chapter also investigates the advantages and disadvantages of the strategies that the EU and the ASEAN have implemented to encourage the usage of electric vehicles. This chapter looks at the many types of regional integration that exist. It will also examine the role of regional organisations and their member nations in addressing climate change. The findings of the current research will be discussed in detail in the sixth chapter, which will conclude the study findings. In addition, this chapter will present the findings of the research as well as the recommendations for the forthcoming research.

V. Findings and Conclusions

Electromobility can be defined as a sustainable ecosystem that integrates from upstream to downstream of the transportation sector, the utilization of renewable energy, the application of alternative fuels, the provision of incentives, and the deployment of environmentally friendly components in electric vehicle manufacturing. The discussion on electromobility is not only about the number of EVs adopted by the public, but also about the type of primary energy used by power plants. The use of renewable energy by power plants is one of the important elements in building an electromobility ecosystem in a country. The development of electromobility plays an important role in the energy transition, especially the transition from fossil fuels to renewable energy. The application of this integration should be regulated in a cross-sectoral and even cross-country legal framework to develop an integrated and sustainable ecosystem. The transition to electromobility is a technological change and a necessity to guarantee energy justice. This implies that it is necessary to ensure a fair and balanced distribution of both the advantages and disadvantages of the transition to avoid any discrepancies that could worsen existing social imbalances. Both national and regional entities, such as the EU and ASEAN, are actively working to encourage the progress of EVs. These regional groups provide structures and guidelines that facilitate EV infrastructure growth, promote cleaner technology use, and collaborate to achieve common environmental objectives.

In the EU legal framework context, electromobility is one of the mechanisms that have become a solution to decarbonisation efforts to achieve climate targets and be climate neutral. The foundation of electromobility development is climate change policy applied in the legal framework of vehicles' energy, finance, and technical aspects, including emission standards and governance of battery production and waste management. Based on the discussion and elaboration of various legal instruments and relevant literature, this research underlines that the development of electromobility by the EU is carried out by adopting strong legal instruments to form an electromobility legal framework.

The principle of solidarity is one of the essential elements, along with democracy and the rule of law, contained in the EU's fundamental law.¹³ The principle of solidarity in the EU legal system developed significantly after the entry into force of the Lisbon Treaty in 2009, which focused on promoting economic, social, and territorial cohesion.¹⁴ The existence of this principle is also a clear statement of the Treaty on the Functioning of the European Union (TFEU), which calls for more robust regional integration. Article 174 TFEU mandates the EU

¹³ Kaisa Huhta and Leonie Reins, 'Solidarity in European Law and Its Application in the Energy Sector', *International and Comparative Law Quarterly* 72, no. 3 (July 2023): 774, <https://doi.org/10.1017/S002058932300026X>.

¹⁴ Esin Küçük, 'Solidarity in EU Law: An Elusive Political Statement or a Legal Principle with Substance?', *Maastricht Journal of European and Comparative Law* 23, no. 6 (December 2016): 970, <https://doi.org/10.1177/1023263X1602300604>.

as a regional organisation to strengthen economic, social, and territorial cohesion by adopting harmonised development policies that take into account regional diversity. Article 177 TFEU also authorises the EU to adopt the necessary economic and legal instruments to strengthen this cohesion.¹⁵

The EU faces internal and external challenges, which are addressed by strengthening the legal framework by changing the legal instrument from directive to regulation. The choice of legal instruments can indicate an institutional commitment to applying strategic plans. Strengthening legal instruments can strengthen EU integration in the areas of climate change and energy that affect electromobility. The EU has chosen a variation of regional solid integration in climate change and energy that is constitutionally reflected in primary and secondary legislation. However, institutionally, the EU recognises that electromobility development cannot be implemented equally in all member states. Each country has internal and external challenges that the EU must address by assisting to achieve the set targets.

This dissertation argues that the EU legal framework on electromobility development is integral to achieving climate targets. Furthermore, the legal instruments adopted cover other policy areas such as energy, finance, and technical electric vehicles. This research's climate target legal framework will focus on emission reduction targets from the transport sector, especially cars and vans. The energy policy area will focus on energy efficiency, renewable energy, and energy performance and buildings. Furthermore, the financial policy area will discuss sustainable finance and state aid as two instruments that affect the acceleration of electromobility development in Europe. In the last section, a discussion will be presented on EV technical aspects, including batteries, which are a vital component in electric vehicles.

ASEAN's organisational foundation is based on informality, consultation, and consensus, which makes cooperation to mitigate climate change impacts less solid. Evidence of this argument is that many ASEAN legal instruments in the form of soft law do not have binding force for ASEAN member states. This condition affects the development of electromobility in the ASEAN region, especially from the aspect of equal distribution of innovation and technology. The principle of non-interference adopted by ASEAN is a barrier to technology transfer between countries with progressive and slow electromobility development. In addition, there is also competition among ASEAN member states to become EV manufacturers without regional regulations governing competition between countries or companies within the ASEAN region.

In this context, the soft law adopted by ASEAN does not work properly as a guideline. Instead, the soft law becomes an obstacle to the economic integration that ASEAN is trying to establish. In the long run, ASEAN legal problems will have a negative impact on the development of electromobility in the region, which will impact emission reduction efforts as a commitment to the Paris Agreement. In addition, the principle of non-interference makes ASEAN countries with large economic powers, such as Singapore, Thailand, Malaysia and Indonesia, less likely to help weak economic powers, such as Laos, Cambodia and Myanmar. Bilateral economic cooperation schemes are instead one of the opportunities to help develop electromobility in economically weak ASEAN countries.

The study also highlights that the development of electromobility in the four countries discussed cannot be said to be ASEAN-driven. Instead, each country's initiative is either due to international pressure, such as commitments in the Paris Agreement or optimisation of natural resources, especially raw materials for EV battery components. Soft laws adopted by ASEAN governing climate change, energy, investment, and smart cities cannot directly encourage and catalyse ASEAN member states to develop electromobility. Unlike the choice of variations of EU integration, whose electromobility development is supported by the adoption of hard law,

¹⁵ Küçük, 971.

ASEAN has chosen a variety of forms of integration as agreed in the ASEAN Charter and is still effective today. The ASEAN Way remains the choice in every era faced by the region. Even climate change, which has a direct impact on the majority of ASEAN member states, has yet to be able to change the choice of integration initiated since the establishment of ASEAN in 1967.

The EU, which has chosen strong regional integration, tends to adopt hard law instruments, while ASEAN, with a weak integration character, adopts soft law instruments. Regional integration as a political choice and decision has implications for electromobility development in each region. With hard law instruments, the EU makes electromobility development efforts more systematic, predictable, harmonious and integrated. Meanwhile, ASEAN prefers soft law instruments that maintain the principle of non-intervention, which makes electromobility development run more flexibly while still having non-binding guidelines adopted by ASEAN.

1. General Findings

To conclude, the discussion on electromobility development in the EU and ASEAN has shown the relatively significant role of regional integration choices and legal instruments adopted by regional organisations. The EU and ASEAN show two polar opposite forms of regional integration and the choice of legal instruments to regulate electromobility development. These differences are influenced by various factors, including historical, political, social and economic. The examples of the EU and the ASEAN show a complexity of internal and external challenges faced by the EU and ASEAN. Therefore, the responses to resolve these challenges are also different. The EU and ASEAN have institutional linkages, especially in cooperation on climate change, energy, and electromobility issues. In general, the results of this dissertation research show that although the EU and ASEAN have different regional integration characteristics which are reflected in the choice of legal instruments adopted to regulate electromobility development, they still have the same goal of mitigating the effects of climate change through reducing emissions from the energy and transportation sectors.

2. The Development of Electromobility Legal Framework in the EU and ASEAN

The EU and ASEAN have different strategies for developing legal frameworks for electromobility. The EU and ASEAN apply two contrasting legal principles in building the electromobility legal framework at the regional level, which ultimately affects the national level. The founding treaties constitutionally recognise the principle of solidarity in the EU legal system. This principle of solidarity has consequences and implications for the design of the EU electromobility legal framework in each member state. In addition, this principle also gives the EU, as a regional organisation, a strong and broad competence to regulate the mitigation of climate change impacts and energy sectors as the essential foundation for electromobility development. The EU also considers electromobility development as one of the strategies to achieve climate and net zero emission targets. Therefore, the legal framework for electromobility development adopted by the EU is inseparable from the issues of climate change, emission reduction, use of renewable energy, energy efficiency, and sustainable investment.

Therefore, this dissertation study concludes that the development of the electromobility legal framework is based on efforts to mitigate the effects of climate change. The design of the electromobility legal framework adopted by the EU is complex, integrated, and has clear targets. The complexity of this legal framework design regulates the upstream to downstream sectors to provide a solid legal foundation for electromobility to be implemented at the national

level of member states. The existence of the principle of solidarity in the EU legal system also has strategic implications for the legal framework for electromobility development. The most visible implication is the positive growth of EV usage in each EU member state. In addition, the adoption of electromobility development legal instruments that apply within the jurisdiction of each EU member state.

ASEAN's strategy differs from the EU's in developing an electromobility legal framework. This dissertation study concludes that the legal framework for developing electromobility in ASEAN has yet to be based on climate change mitigation efforts. The ASEAN legal framework on electromobility is a response to optimising the natural, human and market resources owned by the ASEAN member states. The characteristics of developing electromobility legal frameworks in ASEAN are superficial, prioritising flexibility, and need to be integrated. This is at least partly an implication of two factors: weak organisational competence in the energy sector and the principle of non-interference, which is one of the main foundations of 'the ASEAN Way'. The existence of a flexible and non-integrated legal framework has implications for the legal framework for electromobility development that varies in each ASEAN member states. As a factual result, there is a high disparity between ASEAN member states that have large resources to develop electromobility, such as Indonesia, Singapore and Vietnam and ASEAN member states that do not have resources, such as Laos.

3. Regional Integration Variations and The Choice of Legal Instruments

The EU and ASEAN have significantly different and contrasting regional integration characteristics. The EU is a regional organisation with a strong integration character, while ASEAN is the opposite. The character of regional integration is a conscious choice made by the founding fathers of these organisations as enshrined in the founding treaties. This dissertation research concludes that regional integration is an implication of the legal principles on which the organisation was founded. In the context of the EU, the principle of solidarity is one of the main elements that form a solid regional integration character. In contrast, ASEAN does not use the principle of solidarity as a foundation but applies non-interference as one of the principles that can integrate countries in the Southeast Asian region into a regional organisation.

This difference in the character of regional integration has implications for the choice of legal instruments adopted to regulate electromobility development. The EU, with a strong regional integration character, tends to choose hard law instruments, while ASEAN, with a weak regional integration character, relatively chooses soft law instruments. This dissertation research concludes that the choice of hard or soft law is not good or bad but is influenced by the mandate available in the primary law and the needs of each organisation. In addition, political, economic, social and historical factors strongly influence the choice of legal instruments. In the EU context, choosing hard law instruments to develop electromobility will further integrate and harmonise climate and energy policies. In addition, the choice of hard law instruments can also be a catalyst for stronger regional integration. However, in the ASEAN context, the conditions are different. The choice of soft law instruments is considered to be a catalyst for electromobility development and confirms the choice of integration character.

This dissertation research concludes that the different character of regional integration and the choice of legal instruments in regulating electromobility is a variation and not an anomaly. Nevertheless, it must be recognised that there are disparities in electromobility development between member states with different levels in both the EU and ASEAN variants. In the context of the EU, disparities in electromobility development between member states tend to be low due to the competence and intervention of regional organisations. Moreover, the

solidarity principle imposes obligations on the EU and member states to provide mutual assistance. In the context of ASEAN, the disparity is very large due to regional organisations' low competence and intervention. In addition, it must be recognised that the principle of non-interference is a challenge for AMS, whose electromobility development tends to be slow or even non-existent.

4. The Influence of Regional Organizations Legal Framework on Electromobility Development in Member States

This dissertation research concludes that the legal framework of regional organisations relatively influences the development of electromobility in member states. In the context of the EU, the EU legal framework influences the development of electromobility in member states due to three factors: the principle of solidarity, the strong character of regional integration, and the choice of hard law instruments. These three factors influence the adoption of national laws in EU member states to develop electromobility. In addition, the existence of these three factors implies that the legal character of the adopted national legal framework tends to be harmonized or at least similar and integrated. This condition is a consequence of the EU adopting hard law instruments that either directly or indirectly regulate the development of electromobility.

In the ASEAN context, three factors relatively influence the development of electromobility by AMS: the principle of non-interference, the weak character of regional integration, and the choice of soft law instruments. This dissertation research concludes that the ASEAN legal framework relatively does not have a significant favourable influence or at least has an impact but not equally on all AMS. These three factors exist from ASEAN's formation as a collection of young countries free from colonialism after the Second World War. However, ASEAN has consciously chosen the form of integration it considers most appropriate and compatible with its needs. The existence of the principle of non-interference, the weak character of regional integration, and the choice of soft law instruments indicate the commitment of AMS to remain in a regional organisation without interfering with each other's domestic affairs. In the context of electromobility development, the existence of soft law instruments provides guidelines for AMS to develop EV ecosystems under domestic capacities and capabilities. In addition, AMS also have broad flexibility to determine the pattern and pace of electromobility development under their respective economic, social and cultural circumstances.

This dissertation has confirmed hypothesis 1 (**H1**) where the level of integration in regional international organisations affects the preferred legal instrument to regulate electromobility. The EU with a strong level of integration prefers hard law instruments, while ASEAN with a weak level of integration tends to choose soft law instruments to regulate electromobility. Moreover, this study also confirms hypothesis 2 (**H2**), that the degree of binding legal instruments adopted by regional organisations correlates with the development of electromobility in member states. The development of electromobility in EU member states is relatively more advanced compared to the more slow-paced AMS.

A significant finding in this dissertation is that the character of regional integration affects the choice of legal instruments adopted by the EU and ASEAN to regulate electromobility. The character of regional integration also affects the response of regional organisations to the climate crisis faced by all member states. The choice of adopting hard or soft law instruments has advantages and disadvantages. The advantage is that hard law instruments have binding legal force and oblige member states to implement them in their national jurisdictions. Therefore, they tend to prioritise predictability, synergy, harmonisation, and integration. However, they have the disadvantage of limited flexibility for member states to innovate policies based on existing resources. In the case of electromobility development,

resource equality between EU member states is very important so that climate targets can be achieved through the development of an environmentally friendly vehicle ecosystem. Soft law has similar advantages and disadvantages as hard law. The advantage of soft law is that there is room for flexibility for member states to use their resources to achieve mutually agreed-upon goals. However, soft law has the disadvantage that there is no clear harmonisation, synergy, or standardisation, so the possibility of achieving common targets becomes unpredictable.

Another finding in this dissertation is that due to the different characteristics of regional integration, the EU and ASEAN also have differences in understanding the relationship between law, development, and innovation. The development of electromobility in the EU as part of innovation to address the climate crisis has a foundation in the form of a strong legal framework at the regional level. Therefore, the development of electromobility in the EU context is supported by laws that provide space and a strong foundation for the growth of innovation. Different conditions are experienced by the development of electromobility in ASEAN, which is precisely the opposite of the EU, where the law is present as a response to the need to provide legitimacy and foundation for development and innovation. This difference is based on the main factor of regional integration and two other factors: institutional design and rule of law conditions at national and regional levels.

The findings in this dissertation must be recognised as particularly weak in predicting the future of electromobility in the EU and ASEAN. This study focuses on the character of regional integration and the adopted legal instruments. Therefore, this study argues to a limited extent that without changes in the character of regional integration and legal instruments, the development of electromobility in both regions will not experience significant changes. The EU continues to consistently realise its climate ambitions, and ASEAN also maintains 'the ASEAN Way' as a principle of cooperation, including in the development of electromobility.



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List of publications related to the dissertation

Articles, studies (10)

1. **Nur, A. I.**, Heryana, H., Nur, A. R. N.: Examining The Contribution of Local Government in Advancing Electromobility: Insights From The Legal Framework In Indonesia.
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