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The impact of smart meters on data protection law

O impacto dos contadores inteligentes no direito da proteção de dados

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ABSTRACT: This study aims to analyze the impact of smart meters in regards to data protection law. Having in mind that goal, the investigation takes into account the main goals of energy law, which were reinforced by the Directive 2019/944 (the fourth package). Nowadays, information is power. Being smart meters an important mechanism to promote the necessary energetic transaction, as well as to give more power to consumers, we can't ignore the dangers that might come from its use, namely in regards to data protection law. Thus, we analyze not only how may the data collected go beyond the smart meters' goals, as well as who are, on this context, the controllers and processors. On the other hand, this investigation also has in consideration the difficulty that might exist in the legal basis for processing, as well as which conflicts emerge from the application of the Fourth Package and the General Data Protection Regulation. Having in mind the economic importance of the energy sector, its transition can't be indifferent to the problematics related with personal data, in an era where this is the new oil.

KEY WORDS: Smart meters; energy law; general data protection regulation; directive 2019/944; personal data; energetic transaction.

RESUMO: O presente estudo visa analisar o impacto dos contadores inteligentes no direito da proteção de dados. Tendo em vista este objetivo, realiza-se uma investigação atendendo aos principais objetivos do direito da energia, os quais foram reforçados pela Diretiva 2019/944 (Quarto Pacote). Nos nossos dias, a informação é poder. Sendo os contadores inteligentes um importante mecanismo para promover a necessária transição energética, bem como dar mais poder aos consumidores, não podemos ignorar os perigos que podem advir da sua utilização, mormente quanto ao direito da proteção de dados. Deste modo, analisamos não só como podem as informações recolhidas pelos contadores inteligentes ir além dos objetivos energéticos, bem como quem são, neste contexto, os responsáveis pelo seu tratamento e subcontratantes. Por outro lado, esta investigação tem, ainda, em consideração a dificuldade que pode haver na licitude do seu tratamento, bem como os conflitos que emergem da aplicação do Quarto Pacote e do Regulamento Geral da Proteção de Dados. Atendendo à importância económica do setor energético, a sua transição não pode ser indiferente às problemáticas relacionadas com a proteção dos dados pessoais, numa era em que estes são o novo petróleo.

PALAVRAS-CHAVE: Contadores inteligentes; direito da energia; regulamento geral de proteção de dados; diretiva 2019/944; dados pessoais; transição energética.

SUMMARY:

1. Introduction

2. Smart Meters in EU Law

3. Smart Meters and the General Data Protection Regulation (GDPR)

3.1. Applicability of the GDPR

3.2. Controllers and processors of Smart Meters

4. Legal problems that arise from the use of Smart Meters

4.1. Legal basis for processing

4.2. Overlapping problems between the GDPR and the Electricity Directive

5. Challenges of Smart Meters in the future

6. Conclusion

Bibliography

Relevant documents

Cases

Legislation

> "*No es posible intentar renunciar a nuestra condición digital o destruir la digitalidad porque no se puede volver. Pero sí podemos hacer que esta digitalidad sea más humana. Para ello solo tenemos que preguntarnos cuál es el termino de llegada.*"
>
> Juan Luis Suárez, *La Condición Digital*, Madrid, Editorial Trotta, 2023

1. Introduction

Over the years, the Energy sector has faced several deep changes due to a significant process of liberalization, with the aim to "provide long-term benefits to society"[1]. The European Union (from now on EU) has had a significant impact with its several reforms[2], which provided the elimination of the "remaining obstacles to the free flow of an essential commodity such as electricity."[3] Therefore, having in mind that we're entering a new era in terms of energy[4], new challenges are arising. For this reason, it's not only necessary to fulfill the goals of a sustainable environment, as well as the importance that new technologies might have in pursuing this goal, being essential that the "next generation energy technologies effectively address and resolve the societal difficulties associated with the new current energy mix worldwide."[5] Hence, the introduction of smart meters must be also analyzed from a data protection law perspective, because it might conflict with the General Data Protection Regulation's[6] regime and fundamental rights. After all, having in mind that "personal data is the new oil"[7], this article will focus on the problematics that might arise from the use of smart meters regarding the GDPR.

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[1] PAUL L. JOSKOW, "Lessons Learned from Electricity Market Liberalization", *in The Energy Journal*, 2008, 29, pp. 9-42(11).

[2] With the approval of several different packages, namely: (i) Directive (EU) 96/92/EC of the European Parliament and of the Council, 19 December 1996, (ii) Directive (EU) 2003/54/EC of the European parliament and of the Council, 26 June 2003, (iii) Directive (EU) 2009/72/EC of the European Parliament and of the Council, 13 June 2009 and (iv) Directive (EU) 2019/944 of the European Parliament and of the Council, 5 June 2019.

[3] ROSETA KAROVA, "Capacity Reservations at Interconnectors: an Analysis Under EU Competition and EU Energy Law", *in Competition and Regulation in Network Industries*, 2012, 13(3), pp. 236-255(238). For an analysis of the jurisprudence and the relation between free movement of goods and energy sector see KIM TALAUS, *Introduction to EU Energy Law*, Oxford, Oxford University Press, 2016, pp. 87-103. Additionally, as FILIPE MATIAS SANTOS, "The regulatory Challenges of Disruptive Energy Technologies", *In* CARLA AMADO GOMES / FRANCISCO PAES MARQUES (Coordenadores), *The Transformation Energy Law Through Technological and Legal Innovations*: Instituto de Ciências Jurídico-Políticas, 2018, pp. 51-63(56), https://www.icjp.pt/sites/default/files/publicacoes/files/e-book_transformationenergylaw_icjp_nov2018_fct.pdf (04.03.2023) points out that "the electrification of society can be a matter of lifestyle too." Therefore, it's possible to affirm that an "extensive liberalization of energy policy has taken place at EU level." TONY PROSSER, *The Regulatory Enterprise – Government, Regulation, and Legitimacy*, Oxford, Oxford University Press, 2010, p. 183. On the other hand, this had a significant impact in national politics. For an analysis of the portuguese regime see LOURENÇO VILHENA DE FREITAS, *Direito Administrativo da Energia Introdução*, Lisboa, AAFDL, 2012, pp. 43-45.

[4] Which, as SASKIA LAVRIJSSEN, "The Right to Participation for Consumers in the Energy Transition", *in European Energy and Environmental Law Review,* 2016, 25(5), pp. 152-172(156) points out different goals: facilities for sustainable energy to be incorporated, consumers must be able to produce energy for themselves and the new market players must have sufficient space to operate.

[5] ADRIAN J. BRADBROOK, "Creating Law for Next Generation Energy Technologies", *in Journal of Energy & Environmental Law*, 2011, pp. 17-38(18), available https://law.uh.edu/faculty/thester/courses/Emerging%20Tech%202011/2-1-Bradbrook.pdf (03.03.2023).

[6] From now on GDPR. Regulation (EU) 2016/679 of the European Parliament of the Council, 27 April 2016.

[7] JORGE MORAIS CARVALHO, *Direito do Consumo*, 7th ed, Coimbra, Almedina, 2021, p. 62.

2. Smart Meters in EU Law

A Smart Metering system corresponds to an electronic system that is capable of measuring electricity fed into the grid or electricity consumed from the grid, providing more information than a conventional meter, transmitting and receiving data for information, monitoring and control purposes, using a form of electronic communication.[8] It is considered to be one of the most important "technological development in the transition to a low-carbon energy sector."[9] Therefore, as Max Baumgart points out, the term "smart meter" can refer to meter with the ability for and without a bidirectional communication.[10]

The fourth package introduced by Directive (EU) 2019/944 is considered to be one of the most important in energy law. It aims to create a "truly integrated competitive, consumer centered, flexible, fair and transparent electricity markets in the Union"[11] and it might be argued that the right to energy should be seen as a fundamental right.[12] Hence, the most fundamental principles of Energy's law regulation are consecrated, such as:

— Principle of third-party access to the transmission and distribution systems without discrimination (Article no. 6.º)[13] with the fixation of an *ex*-tariff fixed by an independent regulatory authority;

— Principle of independence of regulatory authorities (Articles no. 56.º - 59.º)[14];

— Principle of public service obligations (Article no. 9.º), which means that the Member States, even in a liberalized market, must fulfill with its obligations as a guarantee State.

— Principle of ownerships unbundling (Articles no. 43.º-53.º), which is seen as "the core element of EU's energy legislation"[15], as it assures that "new market entrants can gain impartial access to energy networks, in order to supply energy to end-users."[16] This is assured through different models, as consecrated on the Directive.[17]

[8] Article 2.º, no. 23 of the Electricity Market Directive.
[9] HENRIK BJØRNEBYE / ANGUS JOHNSTON, "EU Energy Law and Fundamental Rights", *in Marlus*, 2020, 551, pp. 127-169(161), available at: https://www.duo.uio.no/handle/10852/92694 (05.03.2023).
[10] MAX BAUMGART, "(Legal) Challenge to Privacy: On the Implementation of Smart Meters in the EU and the US. Renewable Energy Law and Policy Review", *In* RAFAEL LEAL ARCAS / JAN WOUTERS (Ed) *Research Handbook on EU Energy law and policy*, Cheltenham, Edward Elgar Publishing, 2017, pp. 353-369.
[11] As Article 1 of Directive (EU) 2019/944 prescribes.
[12] Recital 59 states that "Energy services are fundamental to safeguarding the well-being of the Union citizens." On this regard, see MICHAL BIALKOWSKI / BEATA SZETELA, "Discount as an Example of a Guarantee Instrument in the Field of the Consumer's Right to Energy of an Adequate Quality", *In Energies*, 2023, pp. 1-16(2), available https://doi.org/10.3390/en16041559 (03.03.2023). These authors defend that the right to energy should be a fundamental right, by stating that it serves the development of humanity as well as the protection against energy exclusion, as well as the simple idea of deprivation of access to electricity should be protected.
[13] Without whom it'd be impossible to assure the existence of a real competition. This is a reflection of the essential facility theory, meaning that under certain specific circumstances a dominant undertaking may "be under an obligation to enter into agreements with actual or potential competitors" (KIM TALAUS, *Introduction* cit., p. 69). The refusal to grant access when there's an obligation (as it might happen in these different energy's infrastructures) may constitute an abuse of dominant position (Article 102.º of Treaty of Functioning of European Union). For an analysis of the evolution of this concept under competition law see SOFIA PAIS, *Entre Inovação e Concorrência Em defesa de um modelo Europeu,* Lisboa, Universidade Católica Editora, 2011, pp. 550-597.
[14] With this aim, as Recital 80 states, "to take decisions in relation to all relevant regulatory issues if the internal market for electricity is to function properly, and need to be fully independent from any other public or private interests."
[15] HENRIK BJØRNEBYE / ANGUS JOHNSTON, cit., p. 140.
[16] SASKIA LAVRIJSSEN, "The Right…", cit., p. 156.
[17] The ownership unbundling model (Article 43.º), the independent system operator (Article 44.º) where the transmission system belongs to a vertically integrated undertaking, but the member state designates an independent system operator upon a proposal from the transmission system owner (there is a legal separation).

Nevertheless, this new Directive demonstrates the importance of promoting the necessary transaction, with two important missions: change the mode of the generation of energy[18] and, on the other hand, "energy consumption and consumer behavior must also undergo a drastic transition."[19] Hence, it's possible to state that consumers will play an important role in the near future, because "by empowering consumers and providing them with the tools to participate in the energy market it is intended that citizens in the Union benefit from the internal market for electricity."[20] [21]

This empowerment can be seen, as Saskia Lavrijssen points out, as "specifications of and additions to the provisions of the general consumer law directives of the European Union."[22] Therefore, consumers are entitled several rights recognized by the Fourth Package, which allows to make the cleverest choices. As an example, we should point out some of these rights. First, the right to choose freely the supplier (article 4.º) is essential in an open market and it enables all consumers to take full advantage of the opportunities of a liberalized internal market.[23] Additionally, the Directive foresees basic contractual rights (article 10.º), which requires that the contract respects certain requirements (in order to increase the level of protection), as well as the consumers being mandatorily informed of the applicable prices and tariffs, their right to terminate the contract and a good standard of service. Hence, consecrating these basic contractual rights is a first step to protect consumers and, among them, ensure that they are informed at all times. On the other hand, we also have to mention the right to switch and the rules on switching-related fees (article 12.º). Once again, the intention was to protect the consumers, as it is allowed that they can switch suppliers or market participants engaged in aggregation, while respecting contractual conditions, being also mentioned that household customers and small enterprises can't be charged a switch-related fee. Finally, a brief mention should be made to the right to access efficient out-of-court mechanisms for settlement of disputes (Article 26.º), which is essential for the consumers to protect their rights.

Additionally, by exercising the possibilities recognized under the Directive[24], they can become an active consumer. This is the most significant way of empowerment, as consumers have the

Finally, Independent Transmission Operators (Article 46.º-51.º) where "the separation of transmission activities must be achieved through the establishment of an ITO" (HENRIK BJØRNEBYE / ANGUS JOHNSTON, cit., p. 142).

[18] SASKIA LAVRIJSSEN, "Power to Consumers", *in European and Environmental Law Review*, 26(6), 2017, pp. 172-187 points out four different reasons towards a smart energy system, namely: (i) transition from energy fossil fuels to energy generated from renewable sources, (ii) the system has become more flexible and supply-driven, (iii) consumers have increasingly become prosumers.

[19] SASKIA LAVRIJSSEN / BRENDA ESPINOSA APRÁEZ / THIS TEN CATEN, "The Legal Complexities of Processing and Protecting Personal Data in the Electricity Sector", *In Energies,* 15(3), 1088, 2022, pp. 1-24(3), available https://doi.org/10.3390/en15031088 (07.03.2023).

[20] Recital 10 of the Energy Market Directive.

[21] On this regards, SOFIA RANCHORDÁS / ABRAM KLOP, "Data-Driven Regulation and governance in smart cities", *in* VANESSA MAK / TJIN TJONG / ANNA BERLEE (eds.), *Research Handbook in data science and law*, Cheltenham, Edward Elgar Publishing, 2018, pp. 245-273(266) underline that citizens mustn't be confused with typical consumers, because "citizens often only have one single provider of public services: the city" and, thus, public bodies must pursue public interests rather than profit activities.

[22] SASKIA LAVRIJSSEN, "Power to…" cit., p. 179.

[23] Recital 11 of the Energy Market Directive.

[24] According to article 2.º, no. 5, of the Energy Directive Market this is "a final customer, or a group of jointly acting final customers, who consume, or stores electricity generated within its premises located within confined boundaries or, where permitted by a Member State, within other premises, or who sells self-generated electricity

tools to directly participate more in the energy market. Primarily, it's consecrated that active consumers are entitled to sell self-generated electricity to the market (article 15.º, no. 2, b))[25], which will also include the possibility to consume or store electricity generated with its premises.[26] Nevertheless, the most important tool of empowerment is related to the citizen energy communities (article 16.º), an important mechanism to ensure the participation of consumers, as well as helping to pave way for a clean energy transaction. For all these reasons, the Fourth Package has a tremendous importance in reinforcing citizen's rights, but above all, it consecrates the mechanisms to create an adequate environment of consumer's participation within the market, which is a demonstration of how they are becoming more empowered. After all, by directly taking an action in the sector, more importance is being given. Nowadays, everyone can be an important part of this energy transaction.

Having in mind Article 194.º TFEU, over the years, the European Union has done a lot of effort not only to create a competitional environment under EU Law, as well as to create the conditions to a more sustainable transaction on this sector.[27] Hence, as KAISA HUTHA underlines, the development of these technologies can be justified for two reasons: it allows to contribute for the decarbonization of the energy sectors and, on the other hand, it allows keeping reasonable prices for consumers.[28]

Many are the advantages of the use of this mechanism. Firstly, it's clearly important to enable a real-time capture of the consumption of a household.[29] Hereof, this is almost instantaneous, as it has the capacity to record every fifteen minutes or less of what someone is doing in regards to energy use.[30] Consequentially, having in mind the type of information collected, smart meters are in constant communication with the central system (Distribution Systems Operator – DSO), which "not only communicates current or recent metering data, but it also enables the DSO to remotely control functionalities of the meter."[31] Additionally, as Kaitha Hutha states the data collected is very important to allow the improvement of the electricity market, because it activates side response.[32] Therefore, it's very positive for network operators, since it allows for a more precise record of consumer's consumption.[33]

Still regarding the advantages of smart meters, they are a tool to promote empowerment of consumers.[34] At least from an abstract point of view, this could be an important mechanism

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or participates in flexibility or energy efficiency schemes, provided that those activities do not constitute its primary commercial or professional activity."

[25] Recital 42 also mentions that

[26] See Article 2.º, no. 8, of the Energy Directive Market.

[27] As it is pointed out GONÇALO ANASTÁCIO, "Artigo 194.º Energia", *In* MANUEL PORTO / GONÇALO ANASTÁCIO (Coordenadores), *Tratado de Lisboa Anotado e Comentado*, Coimbra, Almedina, 2012, pp. 774-778.

[28] KAISA HUTHA, "Smartening up while keeping safe? Advance in smart metering and data protection under EU Law", *in Journal of Energy & Natural Resources Law*, Volume 38(1), 2019, pp. 5-22(9).

[29] MAX BAUMGART, cit., p. 19. *Vide* RAINER KNYRIM / GERALD TRIEB, "Smart Metering under EU data protection law", in *International Data Privacy Law*, Volume 1, Issue 2, 2011, pp. 121-128(121).

[30] SASKIA LAVRIJSSEN / BRENDA ESPINOSA APRÁEZ / THIS TEN CATEN, cit., p. 2.

[31] RAINER KNYRIM / GERALD TRIEB, cit., p. 121.

[32] KAISA HUTHA, cit., p. 9.

[33] MAX BAUMGART, cit., p. 355.

[34] As FENGIUN LI / BO LUO / PENG LIU, "Secure Information Aggregation for Smart Grids Using Homomorphic Encryption", *In IEEE International Conference on Smart Grid Communication,* 2010, pp. 327-332(327), available https://ieeexplore.ieee.org/abstract/document/5622064 (12.03.2023)

for them to reduce costs and, if it is the case, change habits of consumption.[35] Nevertheless, as Saskia Lavrujssen points out, the instalment of a smart meter isn't enough, as it is necessary to ensure that "information generated has to be communicated to consumers in an easily understandable and digestible format."[36] Thus, and having in mind that they're "a significant element for an intelligent power grid"[37], it will be a missed opportunity if deployed in isolation.[38] After all, digitalization of the energy sector is vital, which is reflected in every single aspect: production, transportation and the way consumers use it.[39]

Regarding EU's legislation, the Third Package[40] already did a (brief mention) to smart meters. On this regard, article 3.º, no. 11, of the Directive consecrated that "the regulatory authority shall strongly recommend that electricity undertakings optimize the use of electricity" using as example "intelligent metering systems or smart grids." Additionally, Article 1.º, no. 2, of Annex I also foresees that Member States should implement intelligent metering systems to assist active participation of consumers in the electricity supply market.[41] However, this couldn't be enough as the obligation remained "of a soft nature, not entailing a binding responsibility for the member states."[42] It's also important to underline that this matter was also addressed with Directive 2009/28/EC of the European Parliament and of the Council[43] in promoting the use of energy from renewable sources[44], as it is stated that Member States should take the appropriate steps to develop a transmission and distribution grid infrastructure, intelligent networks, storage facilities and the electricity system (Article 16.º, no. 1).

The Fourth Package is the most complete of all as it entails several articles on this matter, which also demonstrates a clear will of the legislator to promote the necessary transition. Firstly, it underlines the importance of smart meters, because, as we've said before, they "empower consumers" and "enable distribution system operators to have better visibility of their networks."[45] Hereof, it's clearly underlined that Member States should allow "consumers to benefit from the installation of a smart meter, upon request and under fair and reasonable

[35] Some interesting examples are underlined by HENRIK BJØRNEBYE / ANGUS JOHNSTON, cit., p. 17. By knowing their habits, consumers might "have an incentive to charge their electric vehicle or to wash their clothes at times with the lowest electricity prices, contributing to evening out the periods of peak demand."
[36] SASKIA LAVRIJSSEN, "Power to…" cit., p. 182.
[37] MAX BAUMGART, cit., pp. 353-354.
[38] MURRAY GOULDEN, ET AL, "Smart Grids, smart users? The role of the user in demand side management*", In Energy Research & Social Science,* Volume 2, 2014, pp, 21-29(28), available https://doi.org/10.1016/j.erss.2014.04.008 (12.03.2023)
[39] As it's pointed out by MIKKO RAJAVURI / KAISA HUTHA, "Digitalization of security in the energy sector: evolution of EU Law and Policy", *in Journal of World Energy and Business,* 2020, 13, pp. 353-367(361), available at: https://doi.org/10.1093/jwelb/jwaa030 (12.03.2023)
[40] Directive (EU) 2009/72/EC of the European Parliament and of the Council, 18 July 2009.
[41] For an analysis of the cost-benefit analysis completed by the State Members SEE SILVIA VITIELLO et al., "Smart Metering Roll-Out in Europe: Where do We Stand? Cost Benefit Analyses in the Clean Energy Package and Research Trends in the Green Deal", *in Energies*, Volume 15(7), 2340, 2022, pp. 1-20(3), available at https://doi.org/10.3390/en15072340 (14.03.2023).
[42] ANN-SOFIE VANWINSEN, "Smart Grids: Legal Growing Pains", *in European Energy and Environmental Law Review*, Volume 21, Issue 3, 2012, pp. 142-150(142).
[43] Also known as Directive on the promotion of the use of energy from renewable sources.
[44] Which has been replaced by Directive (EU) 2018/2001 of the European Parliament and of the Council on the promotion of the use of energy from renewable sources of 11 December 2018 (also known as REDII).
[45] Recital 52 of Directive 2019/944.

conditions."[46] Under Article 19.º, no. 1, of the Directive it is stated that the regulatory authority shall strongly recommend the introduction of smart metering systems that are interoperable.

Additionally, it is clarified that the deployment must be subject to a cost-benefit assessment.[47] As Kaisa Hutha underlines, even though it's not mandatory, "the pressure to do so is stronger" that in the previous legal framework.[48] On the other hand, article 20.º establishes the most fundamental principles that must be fulfilled with smart metering systems: (*i)* it shall accurately measure electricity consumption and provide to the final consumer information in time of use, (*ii)* assure the security of its systems, *(iii)* privacy of final customers and data protection must comply with relevant privacy rules, *(iv)* ensure that active consumers who feed electricity can account for electricity fed into the grid, *(v)* data should be made available to final consumers if they request, *(vi)* there must be appropriate information at the time of the installation[49] and *(vi)* smart meters shall enable final consumers to be metered and settled at the same time resolution, as the imbalance settlement period in national market. On the other hand, there is an entitlement to a smart meter, upon request by every final customer user, while bearing the associated costs.

This chapter couldn't end without an analysis of the Portuguese Legislation. This Directive was transposed by Decreto-Lei no. 15/2022[50]. It prescribes that intelligent infrastructures and networks include not only systems of communications, as well as energy treatment data and smart meters.[51] On the other hand, it establishes that the government member responsible for energy sector shall approve the timescale of smart meters' installation and its integration in smart grids' infrastructures. Until 2024, there is a will to assure that all customers are covered by smart meters.[52]

[46] Recital 54 of Directive 2019/944.
[47] Annex II of the Directive establishes the requirements of that cost-benefit assessment.
[48] KAISA HUTHA, cit., p. 9.
[49] *Ibid,* p. 13. As KAISA HUTHA underlines, this information must be easily available without no additional costs to final consumers.
[50] Decreto-Lei no. 15/2022, de 14 de janeiro de 2022.
[51] Article 119.º, no. 1.
[52] Article 282.º, no. 1.

3. Smart Meters and General Data Protection Regulation (GDPR)

3.1. Applicability of the GDPR

Regarding Smart Meters, GDPR is applicable, as there is a processing of personal data.[53] Firstly, personal data means "any information relating to an identified or identifiable natural person." [54] [55] There are, therefore, four requirements that must be pointed out:

(i) any information, meaning that any sort of information might be relevant to the application of the GDPR[56], which "clearly signals the willingness of the legislator to design a broad concept of personal data."[57] Regarding smart meters, Art 29 WP has recognized before that there is a significant amount of information that is relevant, such as: name, address and information of the consumer, unique smart meter ID and property reference number, metadata referring to the configuration of smart meter, description of the message being transmitted, date and time, message content (in this last category, it is pointed out the relevance of meter register read, the possible alerts, the network level information such as voltages, power outages and power quality, as well as load graphics with many details).[58] On the other hand, it's important to mention that even billing data and consumer's payment method might be a relevant information on this regard.[59]

(ii) relating to, which means that it can be considered to "relate" to an individual "when it is about that individual."[60] On this regard, Art. 29 WP identifies three different elements (that need to be considered alternative and not cumulative), namely: content, purpose and result.[61] *In casu,* even if the installation of smart meters aims to promote the reduction of energy consumption, as Art 29 WP has identified in its Opinion regarding these devices, this largely

[53] Article 2.º, no. 1, prescribes that "processing wholly or partly by automated means and to the processing other than by automated means of personal data which form part of a filing system or are intended to form part of a filing system."
[54] Article 4.º, no. 1, GDPR.
[55] After all, as LEE A BYGRAVE / LUCA TOSONI, "Article 4(1)", *In* CHRISTOPHER KUNER / LEE A. BYGRAVE / CHRISTOPHER DOCKSEY, *EU General Data Protection Regulation (GDPR)*, Oxford, Oxford University Press, 2020, pp.103-115 "if data being processed are not personal data, their processing is not subject to such law."
[56] A. BARRETO MENEZES CORDEIRO, "Artigo 4º", *In* A. BARRETO MENEZES CORDEIRO (Org.), *Comentário ao Regulamento Geral de Proteção de Dados e à Lei n.º 58/2019*, Coimbra, Almedina, 2021, pp. 77-100(81).
[57] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Opinion 4/2007 on the concept of Personal Data*, adopted on 20th June, p. 6. Therefore, the conception adopted several decades ago by the German Constitutional Court was left behind, because back then some information wasn't considered worthy of legal protection (as A. BARRETO MENEZES CORDEIRO, "Dados Pessoais: Conceito, extensão e limites", *in Revista de Direito Civil*, No. 2, 2018, pp. 297-321(301) points out). See, for example, Case Court of Justice (CJ) *Nowak*, 20/12/2017, C-434/16, https://curia.europa.eu/, where the court considered that "the written answers submitted by a candidate at a professional examination and any comments made by an examiner with respect to those answers constitute personal data, within the meaning of that provision." *Vide* also MARIA GRAÇA MONIZ, *Manual de Introdução à Proteção de Dados Pessoais*, Coimbra, Almedina, 2023, p. 44.
[58] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Opinion 12/2011 on smart metering*, adopted on 4th April 2011, p. 7.
[59] SMART GRID TASK FORCE, *Data Protection Impact Assessment Template for Smart Grid and Smart Metering Systems*, 2018, p. 25.
[60] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Opinion 4/2007* cit., p. 9. *Vide* A. BARRETO MENEZES CORDEIRO, *Direito da Proteção de Dados à Luz do RGPD e da Lei n. º 58/2019,* Coimbra, Almedina, 2020, p. 110.
[61] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Opinion 4/2007 cit.*, pp. 10-12.

depends "on the collection of large amounts of information about the behavior of consumers."[62] Thus, having in mind the purpose of its use, the data collected relates to a person.

(iii) identified or identifiable. A person will be identified when "he or she is distinguished from all members of the group"[63] and, on the other hand, it'll be identifiable when, even though it hasn't been yet, it's possible to do it with the use of objective factors.[64] Regarding smart meters, even if the data collected can't be directly identified to a certain person, it'll be identifiable, because smart meters have an identification number and, for this reason, "this identifier is inextricable linked with the living individual who is responsible for the account."[65] This is actually the key point, mainly because energy data (metering and consumption data) wouldn't be considered personal data, without this association "with an identified or identifiable user and disclose information on his/her energy usage."[66]

(iv) natural person, which requires that the protection of the legislation is conferred to human beings. This is what happens, *in casu.*[67] For all these reasons, this is a situation where data collected from smart meters is, in fact, considered personal data, as Art 29 WP recognized.[68] One thing is certain: with the development of technology, it is occurring a "even expanding notion of personal data", mainly due to the fact that "more information generated by devices in our homes will fall within the reach of the GDPR as long as they can be traced back to an individual."[69]

Finally, the use of smart meters involves a processing in terms of GDPR, which is defined as "any operation or set of operations which is performed on personal data or on sets of personal data". It's possible to affirm that this is "a deliberately all-encompassing notion that describes almost all operations likely to involve personal data."[70] For this reason, we might identify many relevant examples of data processing, as pointed out by Smart Grid Task Force, such as remote readings for billing purposes and network planning, advance tariffing, provide information to consumers online and remote switching.[71]

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[62] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Opinion 12/2011 cit.*, p. 8.
[63] ARTICLE 29 DATA PROTECTION WORKING, *Opinion 4/2007 cit.,* p. 12. As A. BARRETO MENEZES CORDEIRO, "*O conceito… "cit.,* p. 311, prescribes this is the most complex requirement of all, which requires to establish a deeper definition of it.
[64] Recital 26. *Vide* CJ, *Breyer,* 19/10/2016, C-582/14, paragraphs 31-49. This is a very relevant case, where the CJ recognized that IP Address is considered a personal data.
[65] ARTICLE 29 DATA PROTECTION WORKING, *Opinion 12/2011* cit., p. 8.
[66] ALESSANDRA FRATINI / GIULIA PIZZA, "Data Protection and Smart Meters: The GDPR and the winter package of EU clean energy law", *In EU Law Analysis*, 2018, available http://eulawanalysis.blogspot.com/2018/03/data-protection-and-smart-meters-gdpr.html (20.03.2023).
[67] ARTICLE 29 DATA PROTECTION WORKING, *Opinion 4/2007* cit., pp. 21-22.
[68] SASKIA LAVRIJSSEN / BRENDA ESPINOSA APRÁEZ / THIS TEN CATEN, cit., p. 6 remind that GDPR won't be applicable when the data collected relates to energy companies or when that data cannot be traced back.
[69] INGE GRAEF / MARTIM HUSOVEC / JASPEN VAN DEN BOOM, "Spill-overs in data governance: uncovering the uneasy relationship between the GDPR's right to data portability and EU Sector-Specific data access regimes", *Journal of European Consumer and Market Law*, Volume 9, Issue 1, 2020, pp. 3-16(14).
[70] ORESTE POLLICINO / MARCO BASSINI / GIOVANNI DE GREGORIO, *Internet Law and Protection of Fundamental Rights,* Milano, Bocconi University Press, 2022, p. 193.
[71] SMART GRID TASK FORCE 2012-2014, *Data Protection Impact…* cit., 2018, p. 25.

3.2. Controllers and Processers of Smart Meters

Several actors are relevant when it comes to the Smart Meters.[72] For the purpose of this essay, and before entering the problems regarding in matters of privacy, it's necessary to analyze who might be considered a controller or processor under GDPR.[73] It's only necessary to have in mind, as Kaisa Hutha outlines, that sometimes it might not be enough to determine who falls into these categories exclusively on the basis of EU Law, mainly because "such roles are dependent upon the national market designs and roles of market participations under the legislation of individual Member States."[74]

According to Article 4.º, no. 7, GDPR, in order to exist a controller, it's necessary to fulfill three different requirements, such as: *(i)* being a natural person, legal person or other body[75], *(ii)* determine the purpose and means of processing[76]*, (iii)* alone or jointly.*[77]*

On this matter, Art 29 WP identifies several actors that might function as controllers for processing personal data. The supplier, on one hand, because he is not only responsible for having the contract with data subject, as well as it determines the purposes, conditions and means for which personal data will be processed.[78] Hence, when a smart meter is being used for billing purposes and energy saving, the supplier will be considered the controller.[79] After all, this data processing is really helpful to Energy Suppliers, as they can save money used for manual billing, as well as it allows to "implement demand-based management responses."[80] If these two entities "jointly determine the purposes and means of data processing"[81], there will be jointly controllership (article 4.º, no.7 and 26.º GDPR).

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[72] Sara Cleemput, "Secure and Privacy-friendly smart electricity metering", KU Leuven – PhD dissertation presented for the degree of Doctor Engineering, 2018, p 23, demonstrated an important point: almost everyone will be interested in data collected by smart meters and it gives as example ensure companies, marketeers, criminals and landlords.

[73] For a deeper analysis see Article 29 Data Protection Working Party, *Opinion on the concept of "controller" and "processor"*, adopted on 16 February 2010. *Vide* also European Data Protection Supervisor (EDPS), *Guidelines 07/2020 on the concepts of controller and processor in the GDPR*, adopted on 02/09/2023. On this regard, Mafalda Miranda Barbosa, "Data controllers e data processors: da responsabilidade pelos tratamentos de dados à responsabilidade civil", *In Revista de Direito Comercial*, 2018, pp. 423-494 makes a clear analysis of civil liability that might result from the violations foreseen on GDPR.

[74] Kaisa Hutha, cit., p. 15.

[75] As Article 29 Data Protection Working Party, *Opinion on the concept of controller* cit., p. 4, states this requirement is related to the personal side and even individual person can be considered a controller (see CJ, *Lindqvist*, 6/11/2003, C-101/01).

[76] Oreste Pollicino / Marco Bassini / Giovanni de Gregorio, cit., p. 194 criticize the extreme formalist approach on this requirement, stating that EDPB adopts a more functional approach. It's essential that a power of control exists, whether derived from a direct, implicit or factual influence. As these authors point out "whatever its source, is embodied in the definition of the purposes and means of he processing, that is, the why and how of the processing." *Vide* Maria Graça Moniz, cit., pp. 13-139.

[77] Joint controllers will exist when more "than one actor is involved in the processing." See EDPB, *Guidelines 07/2020*, cit., 2020, pp. 16-23. For a deeper analysis of the jurisprudence, Maria Graça Moniz, cit., pp. 143-146.

[78] Article 29 Data Protection Working Party, *Opinion 12/2011* cit., p. 9.

[79] Lexo Zardiashvili / Francien Dechesne, "The Need for the Consent Management Mechanism in the Energy Sector of the Netherlands and Roadblocks Related to its implementation", *In Report Control of Energy Data*, 2019, available at https://www.universiteitleiden.nl/binaries/content/assets/rechtsgeleerdheid/instituut-voor-metajuridica/scales/roadblocks-to-implementing-consent-management-mechanism-in-dutch-energy-sector.pdf , (03.04.2023), p. 4. For an analysis of the Dutch case see Colette Cuijpers / Bert-Jaap Koops, "Smart Metering and Privacy in Europe: Lessons from the Dutch case", *in* Serge Gutwirth et al (ed), *European Data Protection: Comin Age,* Dordrecht, Springer, pp. 269-293

[80] Xiao-Yi Zhang et al, "Privacy-Functionality trade-off: a privacy-preserving multi-channel smart metering system", *In Energies,* 13, 2020, pp. 1-30(3), available http://dx.doi.org/10.3390/en13123221 (14.03.2023)

[81] Saskia Lavrijssen / Brenda Espinosa Apráez / This Ten Caten, cit., p. 8.

Another one is the DSO, which ultimately will "be responsible for the installation and running of the Smart Meter System."[82] Therefore, they control what is considered to be the first part of metering data process: technical control of the grid, meter management, analytics and statistics[83]. On a second note, the personal data collected will be passed to the supplier for the creation of a bill electricity.[84] Art 29 WP also clarifies that third parties might process personal data within the implementation of smart meters.[85] This can be the case, as some doctrine identifies, where Member States have opted for a separate entity, "which shall provide third parties access to metering data, decoupling the processing of data from the physical meter."[86]

Still regarding the roles that each player might play under GDPR, it's still important to point out that the Electricity Market Directive states that the interoperability of smart meters must be assured. Having that goal in mind, in 2022, the European Commission adopted a draft on interoperability requirements and non-discriminatory and transparent procedures for access to metering and consumption data[87], establishing its requirements, as well as the roles and responsibilities market participants can assume separately or cumulatively. Thus, it defines "meter data administrator" as the party responsible for storing validated historical metering and consumption data and distributing this data to final customers and eligible parties"[88] and eligible party as "an entity offering energy-related services to final customers, such as suppliers, transmission and distribution system operators, energy service companies and balancing service providers."[89] However, even though some obligations are established this draft lacks a clarification of roles and responsibilities of these different actors from a data law protection perspective.[90] We agree with this statement, having in mind the legal complexities that might arise from the use of smart meters are very important to have these different roles clarified, in order to ensure the fulfillment of the GDPR in processing personal data involved.

Regarding processors, they can be defined as "a natural or legal person, public authority agency or other bodies which processes personal data on behalf of the controller."[91] Its qualification relies on the activity that is being carried out in "a specific context."[92] Thinking about smart meters, this might happen, as Kaisa Hutha outlines, when there's a delegation to

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[82] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Opinion 12/2011* cit., p. 9. This assumes an important task, as it "measures energy consumption for specific consumers and data necessary for customer efficiency and management." (DASOM LEE / DAVID J HESS, "Data Privacy and residential smart meters: comparative analysis and harmonization potential". *In Utilities Policy*, 70, 2021, pp. 1-10(6) available https://www.sciencedirect.com/science/article/pii/S0957178721000229 (14.03.2023). *Vide* RAINER KNYRIM / GERALD TRIEB, cit., p. 125.
[83] LEXO ZARDIASHVILI / FRANCIEN DECHESNE, cit., p. 4.
[84] SMART GRID TASK FORCE, cit., p. 26.
[85] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Opinion 12/2011 cit.*, p. 10.
[86] ALESSANDRA FRATINI; GIULIA, PIZZA, cit.
[87] EUROPEAN COMMISSION, *Draft implementing regulation on interoperability requirements and non-discriminatory and transparent procedures for access to metering and consumption data*, 2022, available https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13200-Access-to-electricity-metering-and-consumption-data-requirements_en (13.03.2023)
[88] *Ibid,* article 2.º, no. 7.
[89] *Ibid* Article 2.º, no. 6.
[90] EUROPEAN DATA PROTECTION SUPERVISOR (EDPS)*, Formal Comments on the draft commission Implementing Regulation on interoperability requirements and non-discriminatory and transparent procedures for access to metering and consumption data*, 2022, available https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13200-Access-to-electricity-metering-and-consumption-data-requirements_en (13.03.2023), pp. 6-7.
[91] Article 4.º, no. 8, GDPR.
[92] ORESTE POLLICINO / MARCO BASSINI / GIOVANNI DE GREGORIO, cit., p. 196.

an external service provider[93] (which might be done through a contract or other legal act under EU or other member state law).[94]

4. Legal problems that arise from the use of smart meters

4.1. Legal basis for processing

Regarding smart meters, it's important the legal basis for processing this data. Firstly, consent, which is lawful whenever it is freely given, specific, informed and unambiguous.[95] On this matter, Art 29 WP stated that there was a need to ensure that consumers made a fully-informed decision, which would require that all the information was given.[96] Then, it reminds the importance of allowing these consumers to revoke its consent. Nevertheless, we fully agree with Kaisa Hutha when she outlines that this legal basis for processing personal data derived from the use of smart meters is very tricky, mainly due to the possibility given by Article 7.º, no. 3, of the GPDR to withdraw consent.

This weakness "should be understood in the context of the electricity system as a whole and not only from the point of view of a single consumer."[97] Thus, having in mind the goal of smart meters as a whole, this system "cannot depend upon obtaining voluntary consent from millions of existing customers in circumstances where such consent can be arbitrarily withdrawn."[98] In some countries, smart meters are even mandatory and in some it's necessary a judicial worder to remove them.[99] Additionally, even in countries that adopt a voluntary roll-out of smart meters, it'll always be difficult to state that their consent is freely given: after all, most times operators don't inform enough consumers about their rights and the impact of this device, which means that "average consumers will not be aware of the privacy impact of smart meters measurements."[100]

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[93] KAISA HUTHA, cit., p. 16.
[94] As prescribed by Article 28.º, no. 3, GDPR.
[95] Art. 4.º, no. 7, GDPR. For a better analysis of these different elements see Art 29 WP. Guidelines on consent under Regulation 2016/679. Adopted on November 2017, revised on 10 April 2018. This is very difficult to harmonize data protection and consumer law as DAMIAN CLIFFORD, "Data Protection and consumer protection: The empowerment of the citizen-consumer", *In* GLORIA GONZÁLES FUSTER / ROSAMUNDE BRAKER / PAUL DE HERT (ed.) *Research Handbook on Privacy and Data Protection Law,* Cheltenham, Edward Elgar Publishing, 2020, pp. 229-248, points out.
[96] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Opinion 12/2011…* cit., pp. 11-12.
[97] KAISA HUTHA, cit., p. 18.
[98] *Ibid,* p. 18. Additionally, PAUL DE HERT / DARIUSZ KLOZA, "The Challenges to privacy and data protection posed by smart grids", *In Europäische Projektkultur als Beitrag zur Rationalisierung des Rechts. Tagungsband des 14. Internationalen Rechtsinformatik Symposions*, IRIS 2011, 2011, pp. 191-196(195), raise an important question. Even if it's possible to withdraw consent, should the classical meter "come back in the household"? This needs a deeper discussion. Other authors share the same opinion, such as DOMENICO ORLANDO / WIM VANDEVELDE, "Smart Meters' roll out, solutions in favour of a trust enhancing law in the EU", *In Journal Of Law, Technology & Trust*, Volume 2, 2021, pp. 1-10, available https://www.scilit.net/article/9ed8182b1e11bf2c5ea61eeda050a530 (23.03.2023)
[99] *Ibid,* p. 70. That is the case of France.
[100] COLETTTE CUIJPERS / BERT-JAPP KOOPS, cit., p. 24. Also, RAINER KNYRIM / GERAL TRIEB, cit., p. 126.

Another possibility is using contract as a legal basis that requires the necessity for its performance in which the data subject is a party.[101] *In casu,* having in mind the minimization of processing, this may be used only for suppliers, as it might be necessary for the purpose of billing. However, as Art 29 WP has stated, this cannot be arbitrary as it must be taken into account what is said in that same contract[102], having in mind at all times the necessity. Thus, the supplier won't be able to use it as a legal basis for processing if, for example, uses a third party for other purposes, such as marketing.[103] Taking into consideration the legal complexity of this sector, every assessment "must be conducted separately for each contractual relationship."[104] In fact, the Portuguese Data Protection Authority also clarified this fact, by stating that even the supplier of installation and other entities won't be able to access this data without the express consent of the consumer or a contract that foresees this possibility.[105]

Still, there's a problem: as we've seen the energy supplier deals with the billing process, but the DSOs are the controllers for the smart metering process. As it is outlined by some doctrine, due to the unbundling process, this might raise some issues as "the DSO and the energy supplier has to be legally or at least economically separated and independent even within the same corporate group."[106] Thus, in this case we might consider that the transfer of data on the basis of contractual duty is acceptable, as long as that transfer "is necessary for a third party in order to fulfill its contractual duty towards the data subject."[107] Of course the "necessity" requirements in accordance to GPDR must be respected.

Thirdly, there's the possibility of using legal obligation as a basis for processing[108], which has to be laid down by EU Law or Member State law to which the controller is subject.[109] This covers "obligations that originate directly from a provision in law", as well as situations where the obligation is "specified by an additional legal act under public law."[110] On one hand, the Electricity Market Directive establishes that out by 2024, at least 80% of final customers shall be equipped with smart meters.[111] Additionally, through this legislative reform, it is stated that Member States have to ensure that everyone is entitled on request to have it installed, at reasonable and cost-effective conditions. Is this enough to consider that there is a legal obligation under the GPDR? Kaisa Hutha advocates that there are "more persuasive obligations for the activation of the electricity consumer and the use of flexibility."[112] However, we agree with this author when it considers that these provisions aren't enough to constitute a legal obligation within the meaning of the GDPR.[113] For this reason, we think that it'll reasonable to

[101] Article 6.º, no 1, b) of the GPDR.
[102] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Opinion 12/*2011… cit., p. 12.
[103] KAISA HUTHA, cit., p. 19
[104] *Ibid,* p. 18.
[105] COMISSÃO NACIONAL DE PROTEÇÃO DE DADOS (CNPD), *Diretriz/2019/2: sobre o tratamento de dados pessoais no contexto das redes inteligentes de distribuição de energia elétrica*, p. 7.
[106] COLETTTE CUIJPERS / BERT-JAPP KOOPS, cit., p. 125.
[107] *Ibid,* p. 125.
[108] Article 6.º, no 1, c) of the GDPR.
[109] Article 6.º, no. 3 of the GDPR.
[110] WALTRAUT KOTSCHY, "Article 6 Lawfulness of processing", *In* CHRISTOPHER KUNER / LEE A. BYGRAVE / CHRISTOPHER DOCKSEY, *The EU General Data Protection Regulation (GDPR)*, Oxford, Oxford University Press, 2020, pp. 321-344(332).
[111] Annex II of the Electricity Market Directive.
[112] KAISA HUTHA, cit., p. 20.
[113] *Ibid,* p. 30.

use this as a legal basis for processing in countries where the installation of smart meters is compulsory.[114]

In our point of view, these are the most common legal basis for processing personal data within smart meters. However, as we've seen it's quite hard to adapt them to the complexity of the energy sector.

4.2. Overlapping problems between the GPDR and the Electricity Directive

It's now necessary to analyze the overlapping issues raised by the applicability of the GDPR and the Electricity Directive.

Firstly, we shall analyze the rights of consumers when it comes to smart meters. On this regard, article 20.º, no. 1, f) consecrates the right of information, meaning that all information should be given to final customers prior or at the time of installation of smart meters. The Electricity Directive expressly states that the information must be given in accordance with EU's data protection rules (GPDR).[115] This makes sense, as the "rationale for this provision is that protection of personal data would lack effectiveness if the data subject were not aware of the existence of the processing activity."[116] In the energy sector there are a lot of specificities, so it's quite important to ensure that there is a real information of the data that is being processed.

In Portugal, the Energy Services Regulatory Authority is ERSE. Its regulation no. 610/2019 foresees that consumers shall be informed, up to 15 days after the installation of the smart meter, of: the way to consult energy data in the device, the reading value of the replaced meter, as well as the functionalities associated to smart grids and the mechanisms at the disposal to access registered information.[117] Furthermore, The Portuguese Data Protection Authority has also outlined the importance of assuring that the data subject (consumer of the smart meter) is informed of the proceeding of processing and also its purpose and procedure of the profile creation, in a way that the consumer might be lucid to understand the impact of processing under the use of smart meters.[118]

Secondly, Article 20.º, no. 1, f) of the Directive foresees the right of access, meaning that, on the request of consumers, consumption data shall be provided to them or to a third party acting on their behalf. Additionally, Article 24.º, no. 1, clarifies that Member States must

[114] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Opinion 12/*2011… cit., p. 13.
[115] Articles 13.º and 14.º of the GPDR.
[116] GABRIELA ZANFIR FORTUNA, "Article 13. Information to be provided where personal data are collected from the data subject", CHRISTOPHER KUNER / LEE A. BYGRAVE / CHRISTOPHER DOCKSEY (ED.), *The EU General Data Protection Regulation (GDPR)*, Oxford, Oxford University Press, 2020, pp. 414-433(415).
[117] Regulation no. 610/2019 on the Smart Grids of Electric Energy Distribution, August 2019, articles 9(3) and 9(4).
[118] COMISSÃO NACIONAL DE PROTEÇÃO DE DADOS (CNPD), *Diretriz/2019/2* cit., p. 4.

facilitate the interoperability of energy services. On this basis, the Draft approved by the European Commission states that it's up to the metered data administrator to ensure that *(i)* final customers can have access to their validated metering and consumption data, *(ii)* make that available to eligible parties and *(iii)* receive it in a structured machine-readable and interoperable format.[119] This right, according to A.M. CORDEIRO, describes the essential scope of data subject's legal position.[120] Hence, we agree with the doctrine that reiterates that this provision constitutes "a set of minimum functionalities to be integrated in all smart metering systems", which can be seen as clear reference to "the data protection by design principle under the GDPR."[121] Therefore, taking into consideration the complexity derived from these devices, "the provision may be understood as an example of how the GDPR is to be implemented in relation to smart meter data."[122] Additionally, we should have in mind that this also gives the possibility to eligible parties to receive validated metering and consumption data, even though this transfer of personal data requires that there is an active permission or other legal or contractual basis for the data to be transferred.

From this point of view, in Portugal, Decreto-Lei no. 15/2022 foresees that final consumers that have a smart meter must have access to complementary information about its consumption history that allows them to have detailed intel, such as daily, weekly, monthly or annual information made available through internet or the meter itself.[123]

What might be more problematic is the right to portability, which is also related to the right of access, even though it can't be confused.[124] Under Article 20.º, no. 1, the data subject has the right to receive the personal data concerning him or her, which it has provided, as well as it has the right to transmit that data to another controller without hindrance from the controller to which personal data have been provided.

Hence, it is necessary to meet three cumulative requirements: *(i)* the process must be based on a contract or consent, *(ii)* it must refer to data provided by the data subject and *(iii)* the processing is carried out by automated means. It's quite important to know which kind of data might be considered, because there's an on-going debate in the doctrine. Some authors argue that only data actively provided by the data subject might be included.[125] Others defend a broader approach by stating that all data is included (even the one that are created by the processor). However, it's seeming more suitable to us the intermediary approach stated by the Art 29 WP, meaning that not only data actively provided by the subject, as well as raw data processed is included. It's actually interesting, because on its opinion Art 29 WP gives

[119] Article 5, no. 1, c), of the Draft adopted by the European commission.
[120] A. BARRETO MENEZES CORDEIRO, *Direito da…* cit., p. 262.
[121] ALESSANDRA FRATINI / GIULIA PIZZA, cit.
[122] INGE GRAEF / MARTIM HUSOVEC / JASPEN VAN DEN BOOM, cit., p. 6.
[123] Article 1(4) Annex VII of Decreto-Lei n. º 15/2022.
[124] As MARIA GRAÇA MONIZ, cit., pp. 188-190, points out there are several differences: firstly, portability is restricted to processing that are based in the consent/contract, secondly, in some situations where the data subject didn't have access to its rights, it might still happen portability and, thirdly, the right of access doesn't have so many requirements when it comes to its exercise.
[125] In Portugal, this is the case of A. BARRETO MENEZES CORDEIRO, *Direito da…* cit., p. 294 and VÍTOR FIDALGO, "Artigo 20.º", *In* A. BARRETO MENEZES CORDEIRO(Ed), *Comentário ao Regulamento Geral de Proteção de Dados e à Lei n.º 58/2019,* Coimbra, Almedina, 2021, pp. 204-212(208).

data processed by a smart meter as an example[126], even though it concluded that data created by the data controller (such as the user profile) isn't included on that.

However, comparing the right to portability recognized by the Electricity Directive with the GPDR, there are huge differences. First of all, Article 20.º, a) seems to indicate that there can be a continuous sharing of these data, while "the GDPR seems to be more suitable for one-off data sharing."[127] After all, having in mind the goal of smart meters, this "continuous and real-time access to data is required for providing services that track a customer's energy consumption"[128], which seems to be different from the goal of portability recognized by the GDPR. Additionally, while GDPR allows portability to occur to entities on the same sector or related, the Electricity Market Directive seems to have a more restricted approach, because it only mentions eligible parties (which, in accordance to the draft of the commission, means any entity "offering energy-related services to final customers, such as suppliers, transmission and distribution system operators, aggregators, energy service companies and balancing services providers."[129]). Finally, as it is down to the Member States to decide, the Directive clarifies that no additional fees should be made to consumers, which identifies the goal of promoting their intervention and it clearly contrasts with the regime consecrated in the GDPR.

From what we've seen it's possible to affirm that "the provisions in the Directive are further reaching and more protective of the consumer/data subject than those in the GDPR."[130] However, there's a real contradiction and one question arises: which regime should take precedence? According to the Art 29 WP it's necessary to evaluate the intention of the data subject: if his or her intention is not to exercise rights under the GDPR, but "rather to exercise under sectorial legislation", then GDPR's provisions won't be applicable to this request. Otherwise, if the request is aimed at "portability under the GDPR", the existence of such specific legislation doesn't override the general application of the GDPR.[131]

This might have several problems. As some authors identify, even if this might be partially helpful, the opinions of Art 29 WP and EDPS don't have a binding effect and, consequentially, "judicial authorities might interpretate the interaction differently."[132] On the other hand, this line of thought seems to promote uncertainty, because it's almost impossible to assess in a concrete case what is the will of the consumer. As we've seen if consent is not the best legal basis for processing personal data on this sector it doesn't make sense to use this criterion, as "individual consumers will unlikely be aware of the consequences of basing their request either on the GDPR or a sector specific data access tool."[133] So, in our opinion, it would seem easier

[126] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Guidelines on data portability*, adopted on 13 December 2016, revised and adopted on 5 April 2017, pp. 9-10.
[127] SASKIA LAVRIJSSEN / BRENDA ESPINOSA APRAÉZ / THIS TEN CATEN, cit., p. 17.
[128] INGE GRAEF / MARTIM HUSOVEC / JASPEN VAN DEN BOOM, cit., p. 10.
[129] Even though Member States are free to establish the definition of an eligible party.
[130] SASKIA LAVRIJSSEN / BRENDA ESPINOSA APRÁEZ / THIS TEN CATEN, cit., p. 18.
[131] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Guidelines on Data Portability*… cit., pp. 7-8.
[132] SASKIA LAVRIJSSEN / BRENDA ESPINOSA APRÁEZ / THIS TEN CATEN, cit., p. 18.
[133] INGE GRAEF / MARTIM HUSOVEC / JASPEN VAN DEN BOOM, cit., p. 15.

to apply the *lex specialis derogat legi generali,* meaning that "Energy Law would prevail over the GDPR when dealing with data protection in this specific sector."[134]

Some doctrine also identifies a crucial problem[135]: there might be an overlapping of competence between the Regulatory Authority under the electricity market directive (Article 58.º) and the Regulatory Authority under the GDPR, especially when it comes to, for example, ensure non-discriminatory access to customer consumption data (Article 58.º, no. 1 Directive 2019/944). There is, nevertheless, the possibility of the entity responsible for managing that data refusing that request. Problems from this might arise: even if we' have an energy related problem, it has a data protection scope (even if within the topic of smart meters). If there isn't a coherent approach, this might lead to situations where "they differently interpret concepts, rights and obligations arising from each other's legal framework"[136], which only creates more uncertainty. Thus, depending on certain facts of the case, if there's a situation that falls within the competence of the Energy Regulatory Authority and there is a need to apply GDPR, that energy authority shouldn't be prohibited from exercising its powers. Nevertheless, it shall take into account the interpretation of the GPDR made by the Data Protection Authorities and try, within the possibilities, to avoid contradicting interpretations of data protection law. Additionally, it wouldn't be strange to us if the Energy Regulatory Authority decided to consult the Data Protection Authority. In fact, this might be the answer to promote cooperation and decrease uncertainty.

5. Challenges of Smart Meters in the Future

Despite its advantages, smart meters pose tremendous challenges when it comes to citizens' rights. After all, the data collected might create a certain type of surveillance, because it's possible to know in great detail what happens inside someone's home. It allows, therefore, "a trained eye (not necessarily a human one) to identify which appliances are turned on in a home based on the watt consumed"[137].

Besides, we should take into consideration that, due to its digital system, smart meters can be seen as the perfect target for cyber-attacks, with the aim to interfere in the energy supply system. Also, these attacks might lead to unauthorized access and, eventually, if hackers gain remote access to these smart meters, they might be able to control the meter itself, with an aim, for example, to control the energy usage of the property, as well as completely shut down the system. From the consumer's perspective on the right to data protection, this is very problematic, because the data collected by the meter can be, when processed, linked to a

[134] DOMENICO ORLANDO / WIM VANDEVELDE, cit., p. 8.
[135] SASKIA LAVRIJSSEN / BRENDA ESPINOSA APRÁEZ / THIS TEN CATEN, cit., pp. 18-19.
[136] SASKIA LAVRIJSSEN / BRENDA ESPINOSA APRÁEZ / THIS TEN CATEN, cit., p. 20.
[137] DOMENICO ORLANDO / WIM VANDEVELDE, cit., p. 3.

certain individual and if it lands in the wrong hands, it can be serious.[138] After all, in this era of digitalization, personal data is considered to be the new oil and no one is immune from cyber-attacks. Thus, in this line of thought, smart meters create risks for the consumers, being in peril the right to privacy[139] and the right to data protection.

When we compare to the conventional meters, this is more evident. In fact, readings will have to be performed manually and, when not provided, an estimated bill will be issued. However, contrarily to smart meters, there isn't a continuous storage of data, as all connections will have to be made manually. Therefore, the cybersecurity's risks are lower and, as a consequence, even though the consumers have more concerns to ensure the analogical function of the device, fewer concerns on their rights to privacy and data protection arise.

On the other hand, and bearing in mind these risks, consumers don't have a chance to refuse the change from a conventional to a smart meter[140], being only informed that the change to this new technology will occur.[141] Even though, this might seem incoherent, it's very important that regardless of this imposition, the fulfillment of the principle of proportionality is being ensured.

After all, it's important not to forget that we're talking about fundamental rights. If, for example, in the USA there was a discussion on whether Smart Meters are compatible with the Fourth Amendment[142], in EU Law we must take into account the importance of Article 7.º of the EU Charter of Fundamental Rights, as well as Article 8.º of the European Convention on Human Rights. Hence, from a EU Law perspective[143], it must be outlined that those individuals' rights must be balanced against other fundamental rights, which, *in casu*, it'll be "the need to protect personal data and further the low-carbon transition."[144] Therefore, the crucial is to assess whether the principle of proportionality is met, being essential that *(i)* smart meters are suitable to achieve the desired (it is, as we've seen a useful tool to promote energy efficiency[145] and promote the participation of consumers), *(ii)* smart meters must be necessary to achieve its goal (this has to be answered positively, as they allow to incentivize the participation of consumers and promote energy efficiency). Finally, *(iv)* it mustn't impose a burden on the individual that is excessive in relation to the objective to be achieved. This last point might be the most critical one. In order to ensure that the burden imposed on individuals

[138] KAISA HUTHA, cit., p. 10, also outlines there is "the mass collection, transfer and utilization of detailed consumer and consumption data."
[139] As COLETTE CUIJPERS / BERT-JAAP KOOPS, cit., p.275, point out privacy "can be seen as an umbrella concept, covering different dimensions of personal life."
[140] *Vide* Article 19.º, no. 1, of the Electricity Market Directive.
[141] It's actually interesting because E-Rede's Website clarifies that, as the Distribution Network Operator, it isn't possible to refuse the installment of the meter, even though information has to be made available to the consumer.
[142] Which, as MEGAN MCLEAN, "How Smart Is Too Smart? How Privacy Concerns Threaten Modern Energy Infrastructure", *In Vanderbilt Journal of Entertainment & Technology Law*, Volume 18, Issue 4, 2016, pp. 879-905(887), "provides the primary means of balancing individual privacy with the government's legitimate need to access information." See, for better, development MAX BAUMGART, cit., pp. 365-367.
[143] From an ECHR perspective the balance of proportionality would follow different requirements, being necessary to assess if: the smart meters interfere with privacy, if that infringement is in accordance with the law, if it serves the interests foreseen on article 8.º, no 2, of the ECHR and if it necessary in a democratic society. This last point COLETTTE CUIJPERS / BERT-JAPP KOOPS, cit., p. 279, point out will depend on the type of smart meter in every country.
[144] KAISA HUTHA, cit., p. 11.
[145] MAX BAUMGART, cit., p. 362.

isn't too excessive when compared with the goals achieved, caution is recommended. Some doctrine identifies that if the goal is to promote a more "timely, efficient and cost-effective fashion"[146], then a minimal communication of energy data would be sufficient. On the other hand, if proven the need of more information for grid management, "then information could be aggregated to provide data at scale that is granular enough to serve that purpose."[147]

Nevertheless, and still regarding this last requirement, we shall not forget the importance of conducting a Data Protection Privacy Impact Assessment (DPIA). Under Article 35.º of the GPDR, this is not "a requirement for every processing operation, only those that are high risk."[148], which must of course occur before the processing starts. Thus, the processing derived from smart meters might create a certain risk to its data subject, as this is a type of processing derived from the use of new technologies and is likely to result in a risk to the rights and freedoms of natural persons[149]: it allows, as mentioned previously, to have a deep knowledge of what happens inside a home and it might exist the risk of being used for other purposes. The automated-decision and the fact that this data is processed on a large scale[150] are two reasons why we may consider there's a high risk. Hence, smart meters have the ability to register consumption data in shorts periods of time, which allows for the organization of a "huge volume of data received from users in a specific geographical area in aggregated forms for the efficient maintenance of the grid and for allowing energy utilities to adjust their energy production accordingly."[151]

For this reason, a DPIA is essential and it includes different steps, such as: *(i)* a description process (where it is drawn an initial description of the processing and "making a decision as to whether it is necessary to undertake the DPIA"[152]), *(ii)* an assessment of necessity and proportionality of the processing operations in relation to the purposes, *(iii)* an assessment of the risks to the rights and freedoms of data subjects and *(iv)* the measures that must be adopted in order to envisaged to address the risks (Article 35.º. of the GDPR).

On this regard, the Portuguese Data Protection Authority underlined that, by its recommendation, the Regulation no. 610/2019 of ERSE clarified that the identification of consumption shouldn't be linked to the consumer's name, but to the Delivery Point Codes.[153] Additionally, it also pointed out that it would be useful for the impact assessment to be realized by all the intervenient or, at the least, by the most important ones (which are the suppliers and the DSO's).[154]

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[146] HENRIK BJØRNEBYE / ANGUS JOHNSTON, cit., p. 40.
[147] *Ibid,* p. 40.
[148] DENIS KELLEHER / KAREN, MURRAY, *EU Data Protection Law*, London, Bloomsbury, 2018, pp. 268-269.
[149] Article 35, no. 1, of the GDPR. Even though, as ELENI KOSTA, "Article 35 Data Protection Assessment", *In* CHRISTOPHER KUNER / LEE A. BYGRAVE / CHRISTOPHER DOCKSEY, *The EU General Data Protection Regulation* (GDPR), Oxford, Oxford University Press, 2020, pp. 665-679 "concern not just data protection and privacy rights but also other fundamental rights and freedoms, such as freedom of expression or freedom of movement."
[150] ARTICLE 29 DATA PROTECTION WORKING PARTY, *Guidelines on Data Protection Privacy Assessment and determining whether processing is likely to result in a high risk for the purposes of regulation 2016/679*, Adopted on 4 April 2017, last revised on 4 October 2017, pp. 9-10.
[151] ALESSANDRA, FRATINI / GIULIA PIZZA, cit.
[152] DENIS KELLEHER / KAREN, MURRAY, cit., p. 270,
[153] COMISSÃO NACIONAL DE PROTEÇÃO DE DADOS (CNPD), *Diretriz/2019/2…* cit., p. 3.
[154] *Ibid,* p. 3.

Therefore, the biggest challenge of smart meters resides on the effort to conciliate the goals under energy law (such as the necessary transaction and the empowerment of consumers) and the limits imposed by data protection law. Thus, it seems to us that is very important to assure mechanisms that prevent cyber-attacks, unwanted risks and assure that consumers are protected. In a digital world, information is power and, as everything created by the mankind, everything can be transformed into something different. It's up to us to be careful and prevent that from happening.

6. Conclusion

To sum up, smart meters have inevitably several advantages for consumers, as well as all the environment itself. The goal of promoting the necessary energy transaction and the empowerment of consumers is achieved with its installation. Nevertheless, as we've pointed out throughout this essay, we must not forget that it raises several problems when it comes to data protection law and, in some points, it's quite hard to conciliate such different regimes. On this matter, consent doesn't seem the best legal basis for processing personal data, because that would probably contribute to undermine the necessary stability of energy law, as others seem more suitable (such as contract or legal obligations). Additionally, it's also quite difficult to determine in an exact matter who's the controller or the processor.

An important note goes also to the overlapping problems between the Electricity Market Directive and the GPDR. What seems more problematic to us is the right to portability, which has several differences in both regimes. Therefore, having in mind these differences, it's quite difficult to determine the applicable regime. We don't agree with Art 29 WP when it outlines that it's necessary to determine the intention of the consumer. From a practical point of view, that is almost impossible. Thus, in our opinion, it might be better to apply the *lex specialis derogat legi generali*, meaning that the regime foreseen on the Electricity Market Directive will prevail. Additionally, it is also very important that the Regulatory Authority, when solving a problem that implies the application of data protection law's rules, it will be better if there is a cooperation with the competent authorities in terms of the GPDR.

On the other hand, we shouldn't forget the importance of conduction a DPIA, as this will be an important mechanism to ensure that the proportionality principle is being met. Despite the main challenges and difficulties, it seems, in our opinion, that smart meters will play an important role in the near future, as it is also EU's goal.

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