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ENERGY PERFORMANCE CONTRACTING AS AN INSTRUMENT FOR IMPLEMENTING THE ENERGY EFFICIENCY FIRST PRINCIPLE

Key words: Energy Efficiency First, energy efficiency, Energy Performance Contracting, Energy Union

Summary

The Energy Efficiency First (EE1) principle has emerged as a cornerstone of the European Union's energy transition, transforming energy efficiency from a policy objective into a binding decision-making rule within the Energy Union framework. Codified in Regulation (EU) 2018/1999 and further operationalised in the recast Energy Efficiency Directive (EU) 2023/1791, EE1 requires Member States to systematically assess and prioritise cost-effective demand-side measures before pursuing supply-side investments. This article examines the normative evolution, legal meaning and practical implications of the EE1 principle, with particular emphasis on its implementation through Energy Performance Contracting (EPC).

The study argues that EE1 functions both procedurally and substantively: procedurally, by imposing duties of assessment, comparison and justification in planning and investment decisions; substantively, by establishing a presumption in favour of energy efficiency where it delivers equivalent energy services at lower societal cost and risk. Against this background, EPC is analysed as a key contractual instrument that translates the "first fuel" logic of efficiency into enforceable obligations, measurable performance guarantees and risk allocation mechanisms. By linking remuneration to verified energy savings, EPC operationalises EE1 in public infrastructure, procurement and large-scale renovation projects, particularly within the public sector.

Drawing on EU secondary legislation, European Commission recommendations and other sources, the article demonstrates that EPC embodies the systemic, life-cycle and cost-benefit logic required by EE1. The article concludes that while EE1 has acquired normative status in EU law, its effectiveness ultimately depends on the extent to which instruments such as EPC are embedded in national legal frameworks and administrative practice, thereby ensuring that energy efficiency is treated not as a residual option but as the primary pathway toward climate neutrality and energy security.

Introduction

Energy efficiency is one of the key elements of European Union energy policy. It has long been recognized as "hidden fuel" – one of the most cost-effective instruments for reducing greenhouse gas emissions, enhancing energy security and strengthening economic development. According to the International Energy Agency, the reduced energy demand stemming from energy efficiency over past decades suggests also a shift from energy efficiency a "hidden fuel" to the category of a "first fuel",[1] Although science recognizes that there is no simple correlation between energy efficiency and energy demand reduction,[2] there is no doubt that energy efficiency should be a top priority in government, regional, and local policies.

The development of the Energy Efficiency First Principle (EE1) and giving it normative character is a milestone in shaping European energy policy and the European Union's energy transition. By promoting energy efficiency, the principle emphasizes not only the need to reduce fossil fuel consumption, but also the importance of reducing energy demand and, consequently, production. Both the public and private sectors are therefore encouraged to invest in energy efficiency first, ahead of other, more complex or costly solutions to the energy transition.[3] Moreover, the EE1 posits that enhancements in energy efficiency and other demand-side resources should always be considered equally to supply side resources in energy system planning and prioritized when they are more economically advantageous than comparable power plants, transmission systems, storage solutions, and other supply-side infrastructures.[4]

The EE1 is reflected in regulations imposing numerous energy efficiency obligations on EU Member States. In the Directive on Energy Efficiency (recast)[5] the European Union has adopted an ambitious target to reduce EU final energy consumption by 11.7% by 2023 (compared to 2020 projections for 2030). As it is underlined, while the energy savings potential remains large in all sectors, there is a particular challenge relating to buildings, since 75% of the Union's building stock

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1 International Energy Agency. Energy Efficiency Market Report 2013, pp. 18, 55. Available: https://www.oecd.org/content/dam/oecd/en/publications/reports/2013/10/energy-efficiency_g1g27dbf/9789264206052-en.pdf [last viewed 07.01.2026].

2 Sorrell S. A review of issues, challenges and approaches. Renewable and Sustainable Energy Reviews, Vol. 47, 2015, pp. 76–79.

3 European Commission. Energy Efficiency First. Available: https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-first_en [last viewed 07.01.2026].

4 Jimenez Casanova P., Pinto J. Interpreting the Energy Efficiency First Principle: Help or Hindrance for the Hydrogen Economy? European Energy and Environmental Law Review, Vol. 33, Issue 6, 2024, p. 274.

5 Directive (EU) 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency and amending Regulation (EU) 2023/955 (recast). Available: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023L1791 (EED) [last viewed 07.01.2026].

has a poor energy performance.[6] Moreover, only the public sector is responsible for approximately 5% to 10% of the Union's total final energy consumption.[7] Hence, giving the public sector an exemplary role, the EED introduced a new annual energy consumption reduction target of 1.9% for the public sector as a whole and the annual 3% buildings renovation obligation is being extended to all levels of public administration. To fulfil their obligation, Member States should target the final energy consumption of all public services and installations of public bodies.[8]

Of course, the EED does not prescribe specific methods and tools to achieve the planned results, leaving Member States relatively free to choose them. Obviously, energy efficiency measures can be implemented in different ways and in different forms. The key factors here are the policy adopted and the instruments used to implement it. With regard to energy efficiency, the following policy instruments are named:[9] regulatory, financial and fiscal, information and awareness, qualification and training, market-based, voluntary action and infrastructure investment. Energy efficiency improvement measures can be implemented in various legal forms. Traditionally, public procurement is used for construction works (e.g., deep renovation of public buildings), supplies (e.g., heat supply from renewable energy sources), and services (e.g., energy management). One of these is Energy Performance Contracting (EPC), which combines various elements in an integrated and comprehensive manner to achieve long-term results in energy efficiency.

The legal relevance of EE1 becomes most visible when it is translated into actionable instruments. Among these, energy efficiency improvement agreements – especially EPCs – are pivotal because they contractually bind performance outcomes (savings, avoided demand, improved efficiency) to payment and risk allocation. In other words, they make the "first fuel" (efficiency) operational through enforceable obligations, measurement frameworks and remedies. Thus, EPC, as a policy tool – financial and efficiency scheme, might be applied especially in public sector infrastructure, operationalizing the EE1 principle in an effective way.

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6 See recital 13.

7 See recital 33.

8 Recital 35.

9 Bertoldi P. Overview of the European Union policies to promote more sustainable behaviours in energy end-users. In: Lopes M., Henggeler Antunes C., Janda K. B. (eds.). Energy and Behaviour: Towards a Low Carbon Future. Academic Press, 2020, pp. 451–477.

1. Energy efficiency first principle

1.1. Evolution of the EE1

At EU level, early legislative efforts focused on promoting energy efficiency as one objective among many. Directive 2006/32/EC on energy end-use efficiency and energy services introduced the first coordinated framework, but did not elevate efficiency to a priority decision rule.[10] A more substantial step followed with Directive 2012/27/EU on energy efficiency,[11] which consolidated EU action and established binding measures across the energy chain. By covering both supply and demand-side energy efficiency, it acts as a binding clip for EU energy efficiency policies.[12]

The pivotal role of EE1 was introduced in the vocabulary of EU energy and climate policy with the Juncker Commission's communication on the Energy Union and the "Clean Energy for All Europeans"[13] legislative package from 2016, which included a proposal for a regulation on the governance of the Energy Union and climate action.[14] The principle has further been included in subsequent regulations and amendments of a variety of directives[15] and was first published in 2018 in a Governance Regulation.[16]

A decisive milestone was Commission Recommendation (EU) 2021/1749, which explicitly defined EE1 and provided methodological guidance for its application "from principles to practice".[17] The recast Energy Efficiency Directive in 2023 (EED), completed this evolution by embedding EE1 into binding EU law

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[10] Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC. Available: https://eur-lex.europa.eu/eli/dir/2006/32/oj/eng [last viewed 08.01.2026].

[11] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC. Available: https://eur-lex.europa.eu/eli/dir/2012/27/oj/eng [last viewed 08.01.2026].

[12] Ringel M. Is the updated Energy Efficiency Directive fit for purpose? A critical assessment based on replies from European stakeholders. Energy Research & Social Science, Vol. 127, 2025, Article 104244, p. 1.

[13] European Commission. Clean Energy for All Europeans. COM (2016) 860 final. Available: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52016DC0860 [last viewed 08.01.2026].

[14] von Malmborg F. First and last and always: Politics of the 'energy efficiency first' principle in EU energy and climate policy. Energy Research & Social Science, No. 101, 2023, Article 103126, p. 1.

[15] Chlechowitz M., Reuter M., Eichhammer W. How first comes energy efficiency? Assessing the energy efficiency first principle in the EU using a comprehensive indicator-based approach. Energy Efficiency, Vol. 15, 2022, Article 59, p. 59.

[16] Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action. Available: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R1999 [last viewed 08.01.2026].

[17] Commission Recommendation (EU) 2021/1749 of 28 September 2021 on Energy Efficiency First: from principles to practice – Guidelines and examples for its implementation in decision-making in the energy sector and beyond. Available: https://eur-lex.europa.eu/eli/reco/2021/1749/oj [last viewed 08.01.2026].

and requiring its systematic consideration in energy-related decision-making. The Directive frames energy efficiency as a priority in energy-system planning and investment decisions, requiring that efficiency solutions be considered systematically in relevant decision-making processes.

1.2. EE1 – definition and legal meaning

The Energy Efficiency First principle is defined in Art. 2(18) of the Regulation (EU) 2018/1999, as follows:

> *"energy efficiency first" means taking utmost account in energy planning, and in policy and investment decisions, of alternative cost-efficient energy efficiency measures to make energy demand and energy supply more efficient, in particular by means of cost-effective end-use energy savings, demand response initiatives and more efficient conversion, transmission and distribution of energy, whilst still achieving the objectives of those decisions. From a legal perspective, EE1 operates as both a procedural and a substantive principle. Procedurally, it obliges decision-makers to identify, assess and document efficiency alternatives in a transparent and verifiable manner. Substantively, it implies a preference for efficiency measures where they are demonstrably superior according to objective criteria such as cost-effectiveness, sustainability or system value. However, it has been argued that a clear decision rule would require dedicated legal conditions defining when efforts to consider demand-side resources in investment and policymaking are considered adequate to comply with the principle.*[18]

The EE1 legal meaning has been further implied by the EED provisions, still at the general level. According to the EDD, the EE1 is an overarching principle that should be taken into account across all sectors, going beyond the energy system, at all levels, including in the financial sector. Energy efficiency solutions should be considered as the first option in policy, planning and investment decisions when setting new rules for the supply side and other policy areas.[19]

This approach is supported by other EED provisions, concerning especially public procurement law (in case of which contracting authorities should make energy-efficient purchasing decisions and apply the EE1 in different public contracts and concessions), and the obligation to remove barriers by creating business opportunities for suppliers and energy service providers in this regard.[20]

The impact of EE1 on investment decisions is specifically defined in Art. 3(1) of the EED which obliges. Member States to ensure that energy efficiency solutions, including demand-side resources and system flexibilities, are assessed in planning,

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[18] Mandel T., Pato Z., Broc J-S., Eichhammer W. Conceptualising the energy efficiency first principle: insights from theory and practice. Energy Efficiency, Vol. 15, 2022, Article 41, p. 41.

[19] See recital 15.

[20] See recital 49.

policy and major investment decisions of a value of more than 100 000 000 euro each or 175 000 000 euro for transport infrastructure projects, relating both to the energy systems and non-energy sectors.

As can be seen, the "hard" obligation applies only to very large investment projects. This does not change the fact that the Commission requires (Art. 3(5)), when in applying EE1, Member States shall, among others, promote and, where cost-benefit analyses are required, ensure the application of, and make publicly available, cost-benefit methodologies that allow proper assessment of the wider benefits of energy efficiency solutions where appropriate, taking into account the entire life cycle and long-term perspective, system and cost efficiency, security of supply and quantification from the societal, health, economic and climate neutrality perspectives, sustainability and circular economy principles in transition to climate neutrality. This commitment corresponds to and directly translates into EE1 implementation instruments such as energy service agreements, in particular – Energy Performance Contracting.

1.3. Operationalization of the EE1

EE1's practical impact depends on how Member States and public authorities translate it into policy, legal, procurement and finance regulations. To be legally and administratively meaningful, EE1 must thus be operationalised. Overall, Commission Recommendation 2021 proposed turning EE1 into a structured process: define objectives; identify efficiency alternatives; compare costs and benefits over the life cycle; include system-wide effects; and document the reasoning transparently. Consequently, Commission Recommendation 2021 aimed to transform the concept from principle to practice, and to encourage the correct implementation of the EE1 principle and make it more operational.

The recommendation to EU Member States identifies specific measures to be taken to ensure the correct application of the principle, while the accompanying guidelines support the practical implementation of the principle with practical solutions and refer to measures in various sectors, from energy supply and distribution to end-use sectors.[21] In the context of this article especially important is section 3.7.3 of the Recommendation, concerning EE1 for energy infrastructure investments. European Commission notices that since demand-side solutions are not under the control of transmission and distribution system operators, their implementation and effectiveness would need to be ensured by other players (e.g., energy companies, Energy Service Companies). Thus, it is important to find ways to ensure comparability between short-term measures and long-term investments, as well as developing mechanisms that could guarantee reliability of contracted measures in the longer-time perspective. In terms of buildings (p. 4.4) the Recommendation proposes using Energy Performance Contracts to ensure

[21] von Malmborg F. 2023, p. 8.

guaranteed, measurable and predictable energy efficiency gains (both in final and primary energy terms). This operational logic is precisely what energy efficiency improvement agreements deliver when designed well: they embed baseline-setting, performance indicators, measurement and verification (M&V), and remedial mechanisms into the contract. It is also worth noting that the important role of energy service providers has been recognized in a policy and regulatory planning recommendations.[22]

2. Energy performance contracting

2.1. EPC – definition and legal meaning

Among the various measures to improve energy efficiency, it is no coincidence that the EED focuses on Energy Performance Contracting, promoting EPC in developing, designing, building, and arranging financing for projects that save energy, reduce energy costs, and decrease operations and maintenance costs.[23]

According to Art. 2(33), "energy performance contracting" means a contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where the works, supply or service in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or another agreed energy performance criterion, such as financial savings. The energy service provider (Art. 2(29)) is defined as a natural or legal person who delivers energy services or energy efficiency improvement measures in a final customer's facility or premises. In practice, this term mainly refers to ESCO companies.

It is commonly understood that under EPC arrangement an external organization (ESCO) implements a project to deliver energy efficiency and uses the stream of income from the cost savings, or the renewable energy produced, to repay the costs of the project, including the costs of the investment. The approach is based on the transfer (to a greater or smaller extent) of technical risks from the client to the ESCO based on performance guarantees given by the ESCO. In EPC, payment is based on performance; a measure of performance is the level of energy savings.[24]

According to the Art. 29(1)(a) Member States shall promote the energy services market by disseminating i.e. information on available energy service

[22] See European Commission. Analysis to support the implementation of the Energy Efficiency First principle in decision-making. Final report, December 2020. Available: https://op.europa.eu/en/publication-detail/-/publication/b9cc0d80-c1f8-11eb-a925-01aa75ed71a1/language-en [last viewed 09.01.2026].

[23] See recital 74.

[24] See more: Bertoldi P., Rezessy S., Vine E. Energy service companies in European countries: Current status and a strategy to foster their development. Energy Policy, Vol. 34, Issue 14, 2006, pp. 1818–1832.

contracts and clauses that should be included in such contracts to guarantee energy savings and final customers' rights. Annex XV of the EED, which contains the minimum items to be included in EPCs (or in the associated tender specifications) – these are, among others: (i) a clear and transparent list of the efficiency measures to be implemented or the efficiency results to be obtained, (ii) guaranteed savings to be achieved by implementing the measures of the contract, (iii) reference date(s) to establish achieved savings, (iv) a clear and transparent list of steps to be performed to implement a measure or package of measures and, where relevant, associated costs, (v) a clear and transparent display of the financial implications of the project and the distribution of the share of both parties in the monetary savings achieved, namely the remuneration of the service provider, (vi) a clear and transparent provisions on measurement and verification of the guaranteed savings achieved, quality checks and guarantees, (vii) detailed information on the obligations of each contracting party and of the penalties for their breach.

As a result, the EPC model set out in the EED allows different and equally flexible concepts of EPC cooperation to be implemented in Member States' legislation.[25]

From the point of view of the statistic treatment of EPC contract liabilities in government debt, the methodology for evaluating EPC projects as defined by Eurostat is relevant. The rules for the recognition of EPC contracts on the balance sheet of the private sector are related to its status as "economic owner of the asset". This is the case when the ESCO bears the risk of operating, maintaining and improving the assets from which it derives the benefits of the EPC contract, while its remuneration cannot be guaranteed by a public sector entity and must depend on the guaranteed energy savings.[26]

2.2. Obligations under the EED

Of course, the EED is not limited to defining concepts and general principles of cooperation between public entities and ESCOs. The EE1 principle in relation to EPC is also reflected in the establishment of numerous information and promotional obligations. In particular (Art. 29(1)), Member States are obliged to promote the energy services market and access to it for small and medium entrepreneurs, especially by disseminating clear and easily accessible information on: (i) available energy service contracts and clauses that should be included in such contracts to guarantee energy savings and final customers' rights; (ii) financial instruments, incentives, grants, revolving funds, guarantees, insurance schemes,

[25] Cieslak R. The risk of guaranteed savings in energy performance contracts in the EU and Polish perspective. Energy Efficiency, Vol. 18, 2025, Article 42, p. 6.

[26] See: Eurostat, European Investment Bank, A Guide to the Statistical Treatment of Energy Performance Contracts, May 2018, pp. 16–17. Available: https://www.eib.org/files/pj/guide_to_statistical_treatment_of_epcs_en.pdf [last viewed 09.01.2026].

and loans to support energy efficiency service projects; (iii) available energy services providers, such as ESCOs, that are qualified or certified and their qualifications or certifications; (iv) available monitoring and verification methodologies and quality control schemes. Moreover, other provisions of the EED (Art. 29(5)) impose obligations including: (i) providing model contracts for EPC which take into account the existing European or international standards, available tendering guidelines and the Eurostat guide to the statistical treatment of EPC in government accounts; (ii) providing information on best practices for EPC; (iii) promoting and making publicly available a database of implemented and ongoing EPC projects. Except of this, Member States shall make publicly available and regularly update a list of available energy service providers that are qualified or certified (Art. 29(3)). These responsibilities naturally require specific actions, such as developing guidelines, model contracts, databases on projects and ESCOs, and good EPC practices.

Given that EPC is one of the methods for achieving energy efficiency, the EED does not introduce mandatory use of EPC. The most far-reaching obligation of contracting authorities provided in Art. 29(4) is to promote and ensure (where technically and economically feasible) the use of EPC for renovations of large buildings that are owned by public bodies. For renovations of large non-residential buildings with a total useful floor area above 750 m^2, Member States shall ensure that public bodies assess the feasibility of using EPD and other performance-based energy services. Although in practice this provision only requires an analysis of the appropriateness of using an EPC, it is mandatory. This means that when planning the renovation of larger buildings, the public sector must at least take the EPC into account. Furthermore, Member States may encourage public bodies to combine EPD with expanded energy services, including demand response and storage, in order to ensure energy savings and maintain the results obtained over time through continuous monitoring, effective operation and maintenance. This approach highlights the comprehensive nature of EPC, going beyond energy savings to promote a holistic approach to the renovation of existing building stock.

It is also worth noting that the EED significantly strengthened EE1 in terms of EPC by translating it into procedural duties. Art. 7(3) and (7) oblige Member States to ensure that contracting authorities assess the feasibility of concluding long-term energy performance contracts that provide long-term energy savings when procuring service contracts with significant energy content and that they shall establish the legal and regulatory provisions, as well as administrative practices, regarding public purchasing and annual budgeting and accounting, necessary to ensure that individual contracting authorities are not deterred from using energy performance contracting and third-party financing mechanisms on a long-term contractual basis. Moreover, Art. 5(3d sentence) provides obligation to Member States in supporting contracting authorities in the uptake of energy efficiency requirements (including at regional and local level), by providing clear rules and guidelines including methodologies on the assessment of life cycle costs and environment impacts and costs.

Conclusions

EE1 is an overarching principle that should be taken into account across all sectors, going beyond the energy system, at all levels. In accordance with European Union legislation, this principle must be taken into account in policies, legal and administrative regulations, as well as in instruments for implementing energy efficiency. Taken together, these provisions confirm that EE1 is not merely aspirational, but operationally enforceable through policy, planning, investment and public procurement procedures.

Among the various legal and financial instruments implementing EE1, the EPC model deserves attention, and the EED devotes considerable attention to it. It can reasonably be argued that EPCs – as long-term and comprehensive agreements covering guaranteed energy savings, M&V mechanisms, and risk allocation – are fully in line with the idea and normative nature of EE1. EPC allow public and private entities to overcome capital constraints to implement efficiency projects that reduce demand before investing in new, costly supply infrastructure. This approach contributes to a cost-effective energy transition, reduces greenhouse gas emissions, and enhances security of supply.

The EED regulation provides for a number of legal solutions, the effective implementation of which is crucial for the implementation of the EE1 principle. With regard to EPC, however, it should be emphasized that the mere adoption of legal solutions and tools dedicated to promoting this model does not yet mean that EPC will be used on a wider scale. As practice to date (prior to the transposition of the EED) shows, that in the EU is not a widely used instrument yet.[27]

The transposition of the EPC provisions of the EED should have been carried out by Member States by 11 October 2025. This means that the development of the EPC/ESCO formula can be expected in the next 2–3 years, and it will certainly be worthwhile to conduct research on the manner and effects of the transposition of the EED in this area.

BIBLIOGRAPHY

Literature

1. Bertoldi P., Rezessy S., Vine E. Energy service companies in European countries: Current status and a strategy to foster their development. Energy Policy, Vol. 34, Issue 14, 2006, pp. 1818–1832. https://doi.org/10.1016/j.enpol.2005.01.010
2. Bertoldi P. Overview of the European Union policies to promote more sustainable behaviours in energy end-users. In: Lopes M., Henggeler Antunes C., Janda K. B. (eds.). Energy and Behaviour: Towards a Low Carbon Future. Academic Press, 2020, pp. 451–477. https://doi.org/10.1016/B978-0-12-818567-4.00018-1

[27] Camarasa C., Lutken S., Yargattimath T. The Global ESCO Market 2025. The Global ESCO Network, UN Environment Programme, Copenhagen Climate Centre, 2025, pp. 11–13.

3. Chlechowitz M., Reuter M., Eichhammer W. How first comes energy efficiency? Assessing the energy efficiency first principle in the EU using a comprehensive indicator-based approach. Energy Efficiency, Vol. 15, 2022, Article 59. https://doi.org/10.1007/s12053-022-10063-8
4. Cieslak R. The risk of guaranteed savings in energy performance contracts in the EU and Polish perspective. Energy Efficiency, Vol. 18, 2025, Article 42. https://doi.org/10.1007/s12053-025-10326-0
5. Jimenez Casanova P., Pinto J. Interpreting the Energy Efficiency First Principle: Help or Hindrance for the Hydrogen Economy? European Energy and Environmental Law Review, Vol. 33, Issue 6, 2024, pp. 274–288. https://doi.org/10.54648/EELR2024022
6. von Malmborg F. First and last and always: Politics of the 'energy efficiency first' principle in EU energy and climate policy. Energy Research & Social Science, Vol. 101, 2023, Article 103126. https://doi.org/10.1016/j.erss.2023.103126
7. Mandel T., Pato Z., Broc J-S., Eichhammer W. Conceptualising the energy efficiency first principle: insights from theory and practice. Energy Efficiency, Vol. 15, 2022, Article 41. https://doi.org/10.1007/s12053-022-10053-w
8. Ringel M. Is the updated Energy Efficiency Directive fit for purpose? A critical assessment based on replies from European stakeholders. Energy Research & Social Science, Vol. 127, 2025, Article 104244. https://doi.org/10.1016/j.erss.2025.104244
9. Sorrell S. Reducing energy demand: A review of issues, challenges and approaches. Renewable and Sustainable Energy Reviews, Vol. 47, 2015, pp. 74–82. https://doi.org/10.1016/j.rser.2015.03.002

Other materials

10. European Commission. Analysis to support the implementation of the Energy Efficiency First principle in decision-making. Final report, December 2020. Available: https://op.europa.eu/en/publication-detail/-/publication/b9cc0d80-c1f8-11eb-a925-01aa75ed71a1/language-en [last viewed 09.01.2026].
11. International Energy Agency. Energy Efficiency Market Report 2013. Available: https://www.oecd.org/content/dam/oecd/en/publications/reports/2013/10/energy-efficiency_g1g27dbf/9789264206052-en.pdf [last viewed 07.01.2026].
12. Eurostat, European Investment Bank. A Guide to the Statistical Treatment of Energy Performance Contracts, May 2018. Available: https://ec.europa.eu/commission/presscorner/api/files/document/print/en/memo_17_3269/MEMO_17_3269_EN.pdf [last viewed 09.01.2026].