

Primary energy, the only effective compass towards carbon neutrality in the EU

The négaWatt association (FR) warns about the current revision of the EU Energy Efficiency Directive (EED) under the "Fit for 55" package: the choice pushed by the Council to keep only a binding target in FINAL energy would be a major setback for the efforts of the EU and its Member States in terms of energy transition. Binding energy efficiency targets must be expressed in PRIMARY energy, in order to maximise energy savings, which is an essential means to achieve carbon neutrality and preserve natural resources.

Primary energy/final energy: what are we talking about?

Primary energy is that which is found in nature; **final energy** that which is delivered to consumers, for example at the entrance to buildings. Between the two, **energy transformations** occur, each of which causes **losses** of varying magnitude. For example, the production of 1 kWh of electricity by a thermal power plant, be it "flame" or nuclear, requires about 2 to 3 kWh of primary energy, the **difference between the two being waste heat** that must be evacuated into the immediate environment.


Establishing balances and setting targets in terms of **final energy** rather than primary energy means **ignoring all these losses upstream of consumption** as well as their impact on **resource depletion** and on greenhouse gas (GHG) or pollutant **emissions**. It is therefore an approach that **masks a large part of the reality of our ecological footprint**. In contrast, **primary energy targets require both reducing these losses**, by improving plant efficiency, and **recovering heat**, where possible, for example in district heating networks or for industrial use, thus turning it from a **loss** to a **resource**.

The same applies to all **thermal uses of electricity, particularly in buildings** (mainly heating and hot water production): final energy targets would automatically lead to a **lowering of the required level of energy efficiency** and to an increase in the installation of **electric convectors**, the so-called "toasters", which are less expensive to install but consume a lot of energy. This option would automatically be at the expense of **more efficient solutions** such as **heat pumps** associated with **building renovation** and would entail the risk of seeing the **winter peak demand for electrical power** increase again, a real **issue in countries like France** and an undesirable scenario in the context of the tension on the electrical system that we are experiencing.

Status of the ongoing EU negotiations

The primary/final energy issue is currently being discussed at the European level, in the context of the **revision of the Energy Efficiency Directive (EED)**, in particular around **Articles 1 and 4**, which are supposed to set an **EU-wide target for energy efficiency by 2030** and establish a formula for each **Member State** to calculate its own **national contribution**.

Position of the institutions in the ongoing negotiations:

- The proposal of the EUROPEAN COMMISSION included a **binding EU target in final AND primary energy**, as well as **indicative national contributions also in primary AND final energy**.
 - Under the **French Presidency of the EU** in the first half of 2022, the COUNCIL has proposed to retain only a **binding final energy target** at EU level, making the **primary energy target merely indicative**. At **Member State** level, merely **indicative final energy** targets would be set, with a gap avoider mechanism to ensure that the sum of the national targets matches the European one.
-  The EUROPEAN PARLIAMENT took up the Commission's proposal, maintaining a **binding EU target in terms of primary AND final energy**, and added a **binding** character to the **national contributions**, expressed in **primary AND final energy**.

With the revision of the directive now in the final negotiation phase, the **Council**, which has just moved from a Czech to a **Swedish** Presidency on 1^{er} January 2023, seems **reluctant to move away from its minimalist and counterproductive position**.

Implications of a possible switch to final energy

If the position of the Council were to be finally retained, it would represent a **major setback to the ambition** initially expressed by the European Commission for the revision of the EED:

- **By not taking into account the losses linked to upstream energy transformations, thus not encouraging the advent of an efficient, less resource-consuming and less emitter of pollutants and GHGs energy system**. On the contrary, **the sustainability of the energy system** requires the maximum **energy savings** and the **reduction of thermal power stations**.
- **By abandoning, in fact, the application of the "energy efficiency first" principle**, which is central to the EED revision though, particularly in the **building sector**, and which would require the most **efficient electric heating solutions** to be favored in both new buildings and renovations, rather than electric convectors, which by the way lead to an **increase in peak electricity consumption**, a major problem in France.
- **By reducing the insulation levels required for electrically heated buildings**, as the performance of such a building will be automatically but **artificially enhanced**, without any insulation work. This would be in clear contradiction with the Commission's stated intentions to combat **energy poverty**.
- **By introducing a dichotomy with the Energy Performance of Buildings Directive (EPBD**, whose objectives are expressed in primary energy), also under revision, and a **risk of generalising an approach based on final energy**. This would have a harmful **domino effect** on the fight against energy poverty and the strengthening of the renovation process: **electrification would become a priority**, whereas it should be **complementary to energy efficiency** (a sort of transition from an "efficiency first" principle to "electrification first").

Conversely, objectives expressed in terms of primary energy necessarily lead to efficient solutions such as heat pumps in well-insulated buildings, which make it possible to decarbonise the thermal uses of buildings, reduce electricity consumption and minimise electricity peaks, thereby limiting the need for production capacities and lowering household bills.

Our recommendations

The final trilogue negotiations on the EED, scheduled for the beginning of March, will be decisive in this respect. In the meantime, it is essential that Member States supporting an **ambitious energy efficiency policy** defend a **solid and relevant framework** to make the 2030 target credible:

- A **binding EU energy efficiency target for final AND primary energy consumption**, to move towards a more efficient energy system as a whole, encourage the deployment of more efficient energy sources in national energy mixes and prioritise the enhancement of energy efficiency in the building sector.
- **Binding national contributions expressed in final AND primary energy**, or at least ensure that the gap avoider mechanism also applies to primary energy contributions, in order to ensure a fair distribution of the effort as well as the implementation of ambitious policies for the renovation of buildings and the fight against energy poverty.

In addition, the following objectives also appear to be necessary to match the ambition required by the climate and energy crises:

- A 2030 **energy efficiency target** of at least **-14.5%**, in order to maximise the potential of energy savings, which are the only way to structurally solve the current energy security and high prices crises. This level of ambition, which is the one supported by the European Parliament, has been identified in the **CLEVER¹ scenario** as the right level to keep Europe on a safe and sustainable 1.5° trajectory.
- The strengthening in **Article 8** of the **annual rate of energy saving obligations** by aiming for a rate as ambitious as possible (from 0.8% per year today to 1.5% proposed by the Commission and **2%** by the Parliament).

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For the past 20 years, the négaWatt Association has been carrying out independent energy forecasting work in order to show that an energy transition is not only technically feasible but also desirable for society. Thanks to the complementary nature and field expertise of its members, the association has developed an energy scenario for France – based on its sufficiency, efficiency and renewables approach –, achieving carbon neutrality in 2050.



¹  Clever

[The CLEVER scenario](#) (a Collaborative Low Energy Vision for the European Region), developed under the leadership of the négaWatt association in cooperation with 20+ European partners from the academic world, research, or civil society, proposes an ambitious and realistic 1.5°C compatible energy and climate transition pathway. In particular, the CLEVER decarbonisation trajectory aims to reconcile the long-term climate and sustainability imperatives with the short-term energy security constraints and practical feasibility of such a transformation, mainly through sufficiency, efficiency and renewables.