

# The sustainable transition of Gorj County

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# **The sustainable transition of Gorj County**

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## **List of abbreviations**

<b>BNEF</b>	Bloomberg New Energy Finance
<b>BNR</b>	National Bank of Romania
<b>NACE</b>	Classification of activities in the national economy
<b>OEC</b>	Oltenia Energy Complex
<b>CNSM</b>	National Committee for Macroprudential Oversight
<b>COVID-19</b>	Coronavirus disease 2019
<b>EPC</b>	Energy performance certificate
<b>ETS</b>	EU Emissions Trading Scheme
<b>FCH-JU</b>	Fuel Cells and Hydrogen Joint Undertaking
<b>GW</b>	Gigawatt
<b>GWh</b>	Gigawatt-hour
<b>IEA</b>	International Energy Agency
<b>INS</b>	National Institute of Statistics
<b>IRENA</b>	International Renewable Energy Agency
<b>JRC</b>	The European Commission's Joint Research Centre
<b>kWh</b>	Kilowatt-hour
<b>KWp</b>	Kilowatt-peak
<b>LUISA</b>	Land Use-based Integrated Sustainability Assessment
<b>MW</b>	Megawatt
<b>MDLPA</b>	Ministry of Development, Public Works and Administration
<b>nZEB</b>	Near Zero-Energy Building
<b>PEM</b>	Proton Exchange Membrane
<b>NECP</b>	The Integrated National Energy and Climate Change Plan
<b>PPA</b>	Power purchase agreement
<b>PV</b>	Photovoltaic
<b>PVOUT</b>	Global Photovoltaic Power Potential
<b>SRTL</b>	National Long-Term Renovation Strategy
<b>EU</b>	European Union

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# 1. Summary and recommendations

The main resource of Gorj County is represented by its inhabitants, hence any transformation plan should be centred on them, as they are both the driving force and the beneficiaries of any economic and social progress of their county. The transition towards a carbon-neutral economy, probably the main concern worldwide in the next few decades, requires a significant number of new jobs. That is why Gorj County can rebuild its local identity around the sustainable energy transition, contributing to the significant efforts required for investing in renewable energy, energy efficiency or clean transport, thus continuing to play a central role in the Romanian economy. Gorj County can thus shift from the county with the highest carbon dioxide emissions in Romania to a leading region in this sustainable transition.

This is a favourable moment for starting this transformational process for the county's economy. Post-pandemic recovery, the funding made available across Europe especially for this purpose, but also the significant amounts that Romania has available for the energy transition, along with the commitment of central and local authorities to ensuring a just transition, create the first and, at the same time, a rare window of opportunity for reconfiguring the county's economy.

In supporting this approach, this study proposes a transition path which can ensure sustainable and diversified economic growth, attracting well-paid jobs and increasing the quality of life. For the transition of Gorj towards a sustainable county, this study proposes a series of short-, medium- and long-term objectives. The main immediate priority of the county authorities should therefore be to capitalise on the potential of renewable resources and renovate existing buildings. Renewable energy is the main decarbonisation vector of the European economy. The solar potential in Gorj County is above the national average and, consequently, must represent a priority in this endeavour. At the same time, the renovation of buildings to increase energy efficiency is another opportunity offered by the sustainable transition, with positive effects on the county's economy, as well as on individual households, by reducing energy costs and improving living conditions.

As long-term objectives, Gorj County must attract as large a share as possible of the value chains for advanced energy technologies with a contribution to the decarbonisation process. It is worth mentioning that for the counties where coal mining and its use in the energy sector were the main object of activity, staying relevant in the operation of the national energy system is justified. By developing the proposed value chains, their role will remain relevant.

Following an analysis of the economic situation in the county and of its educational profile, the study identifies four value chains:

1. renewable energy and electricity grids;
2. energy efficiency in buildings and heat pumps;
3. batteries, components and infrastructure for electric vehicles;
4. "green" hydrogen-based technologies. The county's competitive advantages are also presented as well as a few measures that could enhance them.

**Based on this analysis, the study proposes eight recommendations:**

- 1 Investments in renewable energy sources: in solar energy in particular, but also in wind energy.** Gorj County has solar energy resources above the national average, and their exploitation should be a priority for the authorities, especially on state-owned land.
- 2 Deep renovation of buildings** to increase energy efficiency. Such investments lead to major savings of primary energy consumption in buildings, as well as to the significant improvement of the quality of living conditions and to boosting economic activity at local and regional level.
- 3 Developing plans to attract parts of the value chains for advanced technologies** for:
  - renewable energy and electricity grids;
  - energy efficiency in buildings and heat pumps;
  - batteries, components and infrastructure for electric vehicles;
  - “green” hydrogen-based technologies.
- 4 Increasing the competitive advantage of Gorj County compared to other counties, by capitalising on the maximum intensities of state aid** to support the objectives of the European Green Deal and the EU Digital Strategy in transition areas, according to the new *Regional Aid Guidelines*. Implementing models of facilities for investors, such as *Smart Specialisation Strategy* and *Special Economic Zone*.
- 5 Developing an integrated plan for accessing European funding sources**, which should ensure the complementary use of all available financial instruments.
- 6 Increasing the administrative capacity** needed to develop plans and strategies, to attract funding and prepare projects, to exchange experiences with other regions in transition, as well as to build a good relationship with the business environment.
- 7 Establishing a concrete timetable for the phase-out of lignite from the national energy mix**, as this is a key factor in economic planning at county level, which should put forward concrete and realistic solutions for a local post-lignite economy, with a view to controlling the unpredictable effects of this transition.
- 8 Assimilating best practices from other European regions** on mitigating the difficulties of the transition process, especially to maximise the opportunities offered within the EU for coal regions in transition.

## 2. Introduction







**The main resource of Gorj County is represented by its inhabitants, hence any transformation plan for the future of the county should be centred on them, as they are both the driving force and the beneficiaries of any economic and social progress of their county.**

The local identity built around the energy sector is clear, with an emphasis on the contribution made by Gorj County to ensuring the energy required for the country's development over the past 50-60 years and, as well as to ensuring the continuity of supply and the stability of the national power grid, especially through challenging times involving peak consumption or extremely low temperatures. This identity is exclusively related to the lignite industry, which will fade out with the EU's commitment to climate neutrality, but mainly due to the lack of profitability.

The pride of making a decisive contribution to a sector of utmost national relevance and the prospect of losing that status, irrespective of the employees' work and efforts, has led to reluctance towards the expected phase-out of the coal sector. Uncertainties about jobs and income, as well as a sense of neglect and isolation gradually replaced that sense of pride.

However, the transition towards a carbon-neutral economy, probably the main concern worldwide over the next few decades, requires a significant number of new jobs. That is why the people of Gorj County can rebuild their local identity around the sustainable energy transition, contributing to the significant efforts required for the investments in renewable energy, energy efficiency or clean transport, thus continuing to play a central role for the Romanian economy and the endeavours towards modernisation and aligning with the current climate and economic reality.

While the industrial activity of Gorj County has been blamed for carbon emissions and air pollutants, in the future the inhabitants of the county may well be the ones who can make a difference in decarbonising the national economy. Gorj County can thus shift from the county with the highest carbon dioxide emissions in Romania (Figure 1) to a leading county in this sustainable transition.

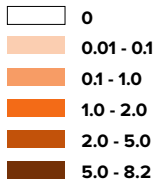
The polarisation of jobs in a single, highly centralised sector, such as lignite-based energy extraction and production, has led to the creation of large categories of employees, miners, and energy operators, treated uniformly and depending on the fate of a single industry. The opportunity provided by the county's sustainable transition towards a green future consists of the wide range of jobs and entrepreneurial opportunities.

The local economy had been built around production-related activities and, for an efficient transformation, the authorities and investors will have to focus on a green future for the county, still based on production activities, with the addition of services and new value chains, including new renewable technologies, batteries, etc.

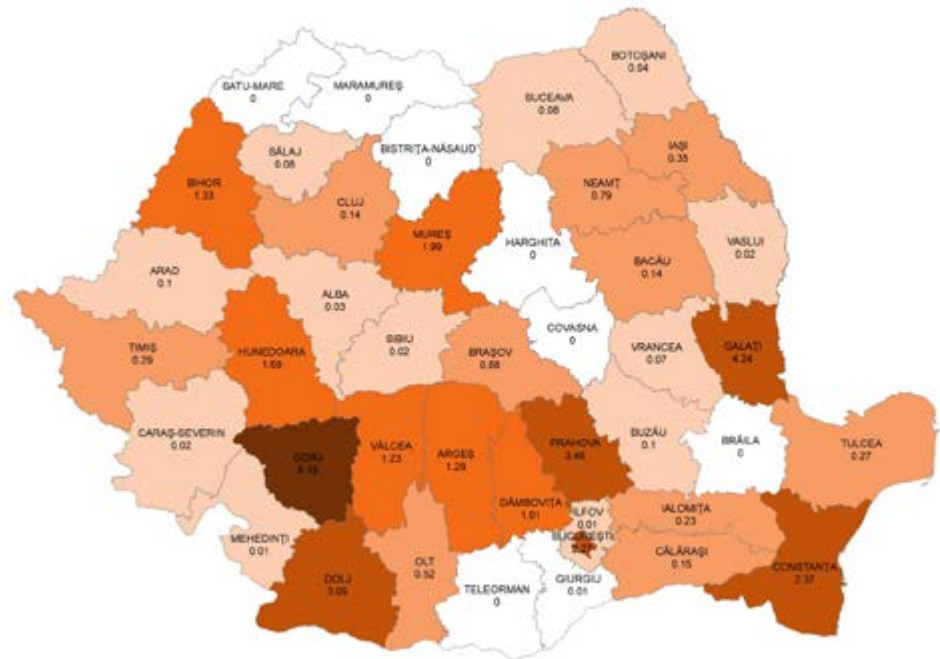
**Figure 1**

Map of CO<sub>2</sub> emissions covered by ETS (except air transport) in 2019 for the county

CO<sub>2</sub> emission in 2019 based on EU ETS, mil tons



Source: European Union Transaction Log; EPG calculations



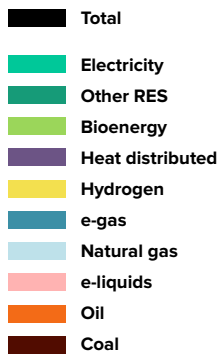
This is a favourable moment for starting this transformational process for the Gorj county economy. Post-pandemic recovery, the funding made available across Europe especially for this purpose, but also the significant amounts that Romania has available for the energy transition, along with the commitment of central and local authorities to ensuring a just transition create the first and, at the same time, a rare window of opportunity for reconfiguring the county's economy in the post-lignite era.

Considering the goals of the Paris Agreement and the highly ambitious long-term decarbonisation targets set by the *European Green Deal*, which envisage achieving climate neutrality in the European Union by 2050, coal will be phased out of the energy mix in the coming years. By 2030, the EU aims to reduce greenhouse gas emissions by 55% compared to 1990, which entails an imminent upward readjustment of targets for renewable energy and for energy efficiency – 32% for renewables and 32.5 % for energy efficiency.

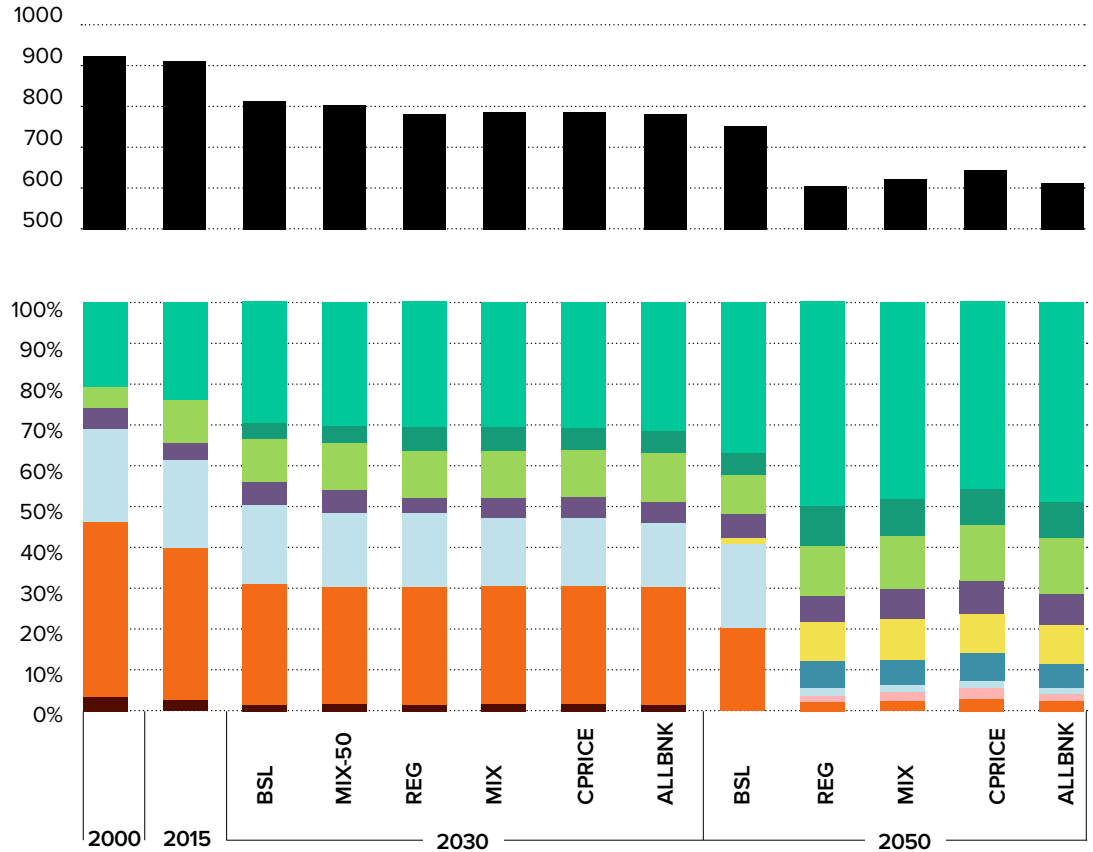
As can be seen in Figure 2, according to the calculations presented by the European Commission in the Long-Term Strategy published in 2018<sup>1</sup> coal will be completely eliminated from the final energy demand across the EU by 2050. In all presented decarbonisation scenarios, the coal input will also be significantly reduced by 2030.

<sup>1</sup> The European Commission (2018)

Figure 2

Final energy demand for various types of fuels<sup>2</sup>

Source: 2000, 2015: Eurostat, 2030-2050: PRIMES model



It should be noted, however, that these calculations were made prior to the EU's commitment to the climate neutrality goal and to the revision of the 2030 targets proposed by the Commission. In July 2021, the European Commission launched a set of legislative proposals through the *Fit-for-55* package, which aims at amending the relevant European regulations and directives in order to reach a new emissions target of 55% for 2030. In this regard, the Commission has also published an impact study<sup>3</sup> on the measures that would be required to achieve this goal. According to the calculations presented, reaching the target will mean that only 17-18% of electricity will still be generated from fossil fuels in 2030.

According to the scenarios developed by the European Commission within the impact study, one can also notice that the main contribution to the partial decarbonisation of the economy by 2030 will come from the power production and building sectors, which will have to reduce their carbon footprint by about 70% and over 60%, respectively. The recommendations proposed by this study reflect the calculations advanced by the Commission. That is why the main interventions proposed in the short and medium term – developing renewable resources and renovating buildings in Gorj County – are handy solutions for reducing emissions in these sectors.

2. Three of the scenarios analysed in the European Commission's impact study reach an emission reduction level of -55% in 2030 versus 1990 (including LULUCF). The REG scenario relies on a boost of policies and regulations, the CPRICE scenario relies on reducing emissions by increasing the price of carbon and expanding it in the road transport and buildings sectors, while the MIX scenario is a combination of measures between the previous two.

3. The European Commission (2020)

**Table 1**  
Emission reductions required in order to reach the 2030 targets according to the European Commission's calculations

Source: Ecological Institute (2020)<sup>4</sup>

Sectors	Selected IA scenarios		
	REG	MIX	CPRICE
Buildings	- 63.6 %	- 63.6 %	- 63.6 %
Industry	- 23 %	- 23 %	- 23 %
Power production	- 69.6 %	- 69.6 %	- 69.6 %
Transport	- 17.6 %	- 17.6 %	- 17.6 %
Agriculture & Waste	- 31.0 %	- 31.0 %	- 31.0 %

In this European context, especially under the pressure of prices for CO<sub>2</sub> certificates, lignite-based power generation within the Oltenia Energy Complex (OEC), the main economic operator in the county, will be significantly reduced in the coming years. In addition to the company's economic losses and lack of profitability<sup>5</sup>, the situation of OEC worsened between 2020-2021, with prices for CO<sub>2</sub> certificates reaching record levels and declining energy demand in the context of the crisis caused by the Covid-19 pandemic.

In fact, OEC is undergoing a process of restructuring, in order to phase out lignite-based electricity production and lower greenhouse gas emissions. It must be noted that assessing the feasibility of the restructuring plan for OEC is not the subject of this report. This study aims, instead, at drafting development directions for the entire county in line with the ongoing climate transition currently occurring in Europe, without analysing in detail the issue of lignite in the national energy mix.<sup>6</sup>

However, one of the key recommendations is the need to establish a concrete timeline for ceasing lignite extraction and use. This is essential for strategic planning, with concrete solutions synchronised with the elimination of lignite-based electricity production, in order to counterbalance the possible local negative effects of this transition. A strict plan for absorbing the economic and social impact of the transition can, in fact, lead to sustainable and long-term economic development of the county. It is therefore inevitable that any development plan of Gorj County should be correlated with restructuring OEC, which must include a realistic timetable for eliminating the use of lignite.

4. Ecological Institute (2020)

5. EPG (2020)

6. A more detailed discussion – on the consequences of phasing out lignite-based electricity generation capacities in terms of the security of supply, wholesale electricity prices, imports demand, the cost related to investing in new generation capacities, as well as the cost of ensuring a just transition in the region – can be found in a study published with the contribution of EPG in 2020.

This aspect needs to be emphasised. According to a JRC study,<sup>7</sup> developing the generation capacities and the production of renewable technologies in EU's coal regions could create between 106,681 and 314,416 jobs by 2030 and up to 460,000 by 2050, which should replace the approximately 200,000 jobs currently depending on coal mining. Thus, the economic directions presented in this report can not only mitigate the effects of the transition in the region, but also contribute to further economic development. This requires rigorous county-level planning.

In fact, Gorj County Council is currently working on drafting the Territorial Just Transition Plan, required for obtaining the funding granted by the European Union through the Just Transition Fund. This tool is specially designed for coal areas currently at the forefront of the decarbonisation process. Its purpose is to maintain economic production and increase the level of employment in Gorj, affected by phasing out lignite. This plan will focus on economic diversification, retraining and active inclusion of workers and people looking for a job in the county. The plan also aims at supporting the industrial investment needed in the transition to a climate-neutral economy.

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## CAP. 2

In order to support this approach and the development of other complementary transition strategies for the county, this study proposes a transition path which can ensure sustainable and diversified economic growth, attracting well-paid jobs and increasing the quality of life for the people of Gorj. For the transition of Gorj towards a green county, this study proposes a series of short-, medium- and long-term objectives. The main priority of the county authorities is therefore to develop the potential of renewable resources and renovate existing buildings. Chapter 2.1 presents estimates of the solar and wind potential in the county, while also identifying some areas where such investments can be initiated.

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**Renewable energy is the main decarbonisation vector of the European economy. The solar potential in Gorj County is above the country's average and, consequently, must represent a priority in this endeavour. At the same time, the renovation of buildings to increase energy efficiency is another opportunity offered by the sustainable transition, with positive effects on the county's economy, as well as on individual households, by reducing energy costs and improving living conditions. Such investments can not only reduce final energy consumption, increasing household savings, but can also contribute to increasing the beneficiaries' quality of life and stimulating economic activity locally and regionally.**

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Section 2.2 presents the situation of the building stock in the county, then providing an estimate of the costs related to renovating existing buildings in Gorj.

As long-term objectives, Gorj County must attract as large a share as possible of the value chains for advanced energy technologies with a contribution to the decarbonisation process. It is worth mentioning that for the counties where coal mining and its use in the energy sector were the main object of activity, staying relevant in the operation of the national energy system is justified. By developing the proposed value chains, their role will remain relevant. In order to understand what such value chains can be attracted in Gorj County, the current economic situation must be thoroughly analysed.

**CAP. 3**

Chapter 3 presents an analysis of both NACE section and division level, followed by an overview of the economic activities dependent on OEC, and an analysis of the exports of companies in the county, in order to identify economic operators that are already competitive in international markets. Last but not least, the chapter makes an analysis of the educational profile of the vocational schools in the county. In addition to the existence of a well-developed electricity transmission infrastructure and the local power generation profile, the county benefits from a technical educational profile in vocational schools.

Courses attended by students trained in mechanics, electronics, automation, electromechanics and electricity, as well as in construction and utilities installations can be adapted to the specific needs of value chains for the advanced technologies presented in this chapter. In addition, the human resources currently employed in the energy production sector, represented in particular by mechanical or electrical technicians and by energy, electrical and mechanical engineers, may be retrained for other manufacturing, installation or operation and maintenance activities for new technologies.



**CAP. 4**

Based on this analysis, as well as on European developments, Chapter 4 identifies four value chains on which a county development strategy should focus:

- renewable energy and electricity grids;
- energy efficiency in buildings and heat pumps;
- batteries, components and infrastructure for electric vehicles;
- green hydrogen-based technologies.

The study presents the competitive advantages that Gorj County can have in attracting such value chains. The county authorities and the relevant industrial actors must be aware of competing with other counties and regions in Romania for attracting and developing value chains.

It is therefore necessary to identify and build additional competitive advantages for the county to use in this competition. Hence, a key element is that of increasing local and regional administrative capacities, as well as creating an attractive environment for investors. This chapter also proposes a series of measures regarding state aid and fiscal facilities, as well as funding suggestions for attracting value chains for advanced technologies in the county.

**CAP. 5**

Finally, Chapter 5 presents eight recommendations that can contribute to capitalising on the potential for sustainable transition of Gorj County.





# 3. Assessing the potential offered by the transition in Gorj County







**Developing renewable energy sources is the main vector for the decarbonisation of the European economy. Thus, the transition of Gorj towards becoming a green county will have to be based primarily on the development of the area's potential for renewables.**

According to the estimates in this chapter, Gorj County has solar energy resources above the national average. Exploiting these, especially on publicly owned land, must represent a priority for the authorities. There are also areas with potential for installing wind farms. The location of these should not be determined by detailed measurements performed *in situ*.

This section presents estimates of the solar and wind potential in Gorj County, then identifies some areas suitable for renewable energy projects.

## 3.1 Renewable energy

Recent studies conducted by the European Commission through its Joint Research Center (JRC) have demonstrated the high potential of renewable energy in the South-West region, hence in Gorj County, as well (JRC, 2021).

The high values of the solar and wind energy potential resulted from calculations that take into account climate characteristics, landscape features and other geographical conditions in the South-West Oltenia region, as well as the area available for renewable energy projects that could be achieved in the coming years.

The results of these calculations are presented in Table 2:

**Table 2**

The technical potential of renewable energy of the South-West Oltenia region

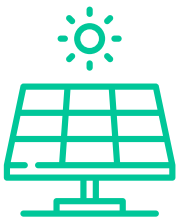
Source: JRC (2020)

	Technical potential (GW)	Potential of generated energy (GWh/year)
Wind energy	11.21	22.104
Photovoltaic energy	33.88	8,154
Bioenergy (biogas, biomass and waste)	0.58	16,507 (primary energy)
Geothermal energy	0.14	1,138

Within this study, the values calculated by the JRC were validated by a modelling tool using satellite data, taken from several global and European databases: Global Solar Atlas, Global Wind Atlas, CORINE Land Cover, as well as the LUISA (Land Use-based Integrated Sustainability Assessment) platform. For a realistic approximation, the technological details and technical characteristics of PV systems and wind turbines were taken from the JRC study. This method<sup>8</sup> confirmed that the values in Table 1 for PV and wind energy are optimistic, yet theoretically and technically reasonable. Specifically, JRC values anticipate the effective use of all currently available land, without taking into account the development of projects in other sectors on these areas. At the same time, values of over 10 GW for wind energy and 30 GW for PV energy can be validated with a high level (over 95%) of confidence.

In conclusion, the high technical potential of the South-West region could be achieved if both the authorities and the investors prioritise investments in PV and even wind projects to the detriment of other sectors. However, even if the technical potential of these technologies is not fully achieved, the development of renewable energy could grow at an accelerated pace without raising the issue of lack of land (excluding protected areas, built-up areas or land already in the farming circuit).

## 3.1.1 The potential for solar energy



**In terms of the potential of PV technology, the South-West Oltenia region ranks among the top coal regions in transition in the EU. The geographical and climate conditions in the region enable both the construction of large PV parks (potential capacity of 30.48 GW) and the large-scale distribution of PV panels for domestic and non-domestic consumers (potential capacity of 3.40 GW).**

Figure 3 illustrates the regional potential through data indicating the average level of energy generated in relation to the installed power (PVOUT). This value, of approximately 1,336 kWh/kWp, is over 30% higher than the European average of 1,020 kWh/kWp. At the same time, the PV potential of the South-West Oltenia region is higher than Romania's average potential, of 1,285 kWh/kWp. The high potential of the generated energy is based on the geographical conditions of the region, which has a high value of the intensity of solar radiation throughout the year (1,283 kWh/m<sup>2</sup> compared to 900 kWh/m<sup>2</sup> in Europe and 1,225 kWh/m<sup>2</sup> in Romania).

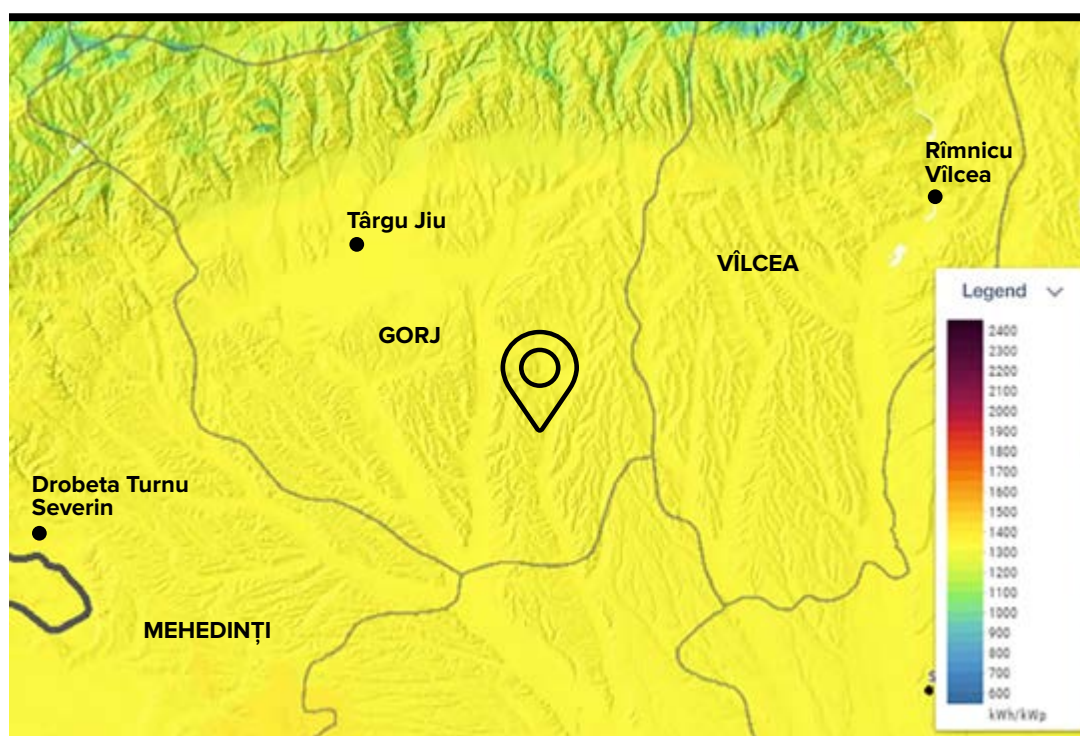
<sup>8</sup>. For the validation of these data, the technical potential was defined as: Technical potential (MWh/year) = Available area (km<sup>2</sup>) \* Radiation intensity (MW/km<sup>2</sup>) \* Capacity factor (hours/year)

Un alt factor important în evaluarea potențialului regional este valoarea specifică a PVOUT pentru parcurile fotovoltaice (1.263 kWh/kWp), acestea urmând să fie proiectate în următorii ani de către CEO ca parte a efortului de decarbonare din cadrul Planului de Restructurare 2021-2026. Planul anunță o serie de parcuri fotovoltaice instalate pe depozitele de zgură și cenușă închise din cadrul termocentralelor Rovinari, Turceni și Ișalnița – primele două situate în județul Gorj. Tabelul 3 prezintă potențialul acestor zone pentru dezvoltarea de parcuri fotovoltaice. Toate cele trei locații au un randament potențial al energiei fotovoltaice peste media regiunii.

**Figure 3**

Photovoltaic energy potential  
in the South-West region  
(kWh/kWp)

Source: Global Solar Atlas (2021)

**Table 3**

The potential of PV energy  
in the areas of projects  
to be developed by OEC

Source: Global Solar Atlas (2021)

Photovoltaic park location	PVOUT (kWh/kWp)
Rovinari	1,320
Turceni	1,324
Ișalnița	1,328

Thus, the South-West region ranks immediately after the South-East and South-Muntenia regions among the most suitable areas in Romania for the installation of new photovoltaic capacities.

Table 4 describes the potential of different types of photovoltaic systems in the South-West region, broken down by county.

**Table 4**

The potential of photovoltaic energy by type of PV system

Source: Global Solar Atlas (2021)

County	PVOUT (kWh/kWp)	Photovoltaic parks PVOUT (kWh/kWp)	Residential systems PVOUT (kWh/kWp)	Commercial and industrial systems PVOUT (kWh/kWp)
GJ	1,321	1,301	1,258	1,256
DJ	1,309	1,324	1,249	1,278
MH	1,341	1,324	1,282	1,279
OT	1,342	1,330	1,296	1,284
VL	1,316	1,303	1,262	1,258

The comparative advantage of the South-West region lies in the capacity of its electricity network to take over this energy, without any pressure on the electricity transmission infrastructure. Thus, investors can start developing significantly sized projects in the near future, benefiting from regional conditions. A significant part of the land available for photovoltaic projects already has access to the electricity grid.

Within the South-West development region, Gorj stands out as a county with high potential, especially in terms of photovoltaic parks. Apart from the locations around the closed slag and ash dumps within the Rovinari and Turceni thermal power plants, a number of other localities have quite good prospects for the development of renewable energy: Motru, Târgu Cărbunești, Tismana, Bălești, Berlești, Aninoasa, Florești, Fântânele, etc.

Some indicators of the potential around these places can be seen in Table 5:

**Table 5**

Areas with high solar energy potential in Gorj County

Source: Global Solar Atlas (2021); EPG calculations

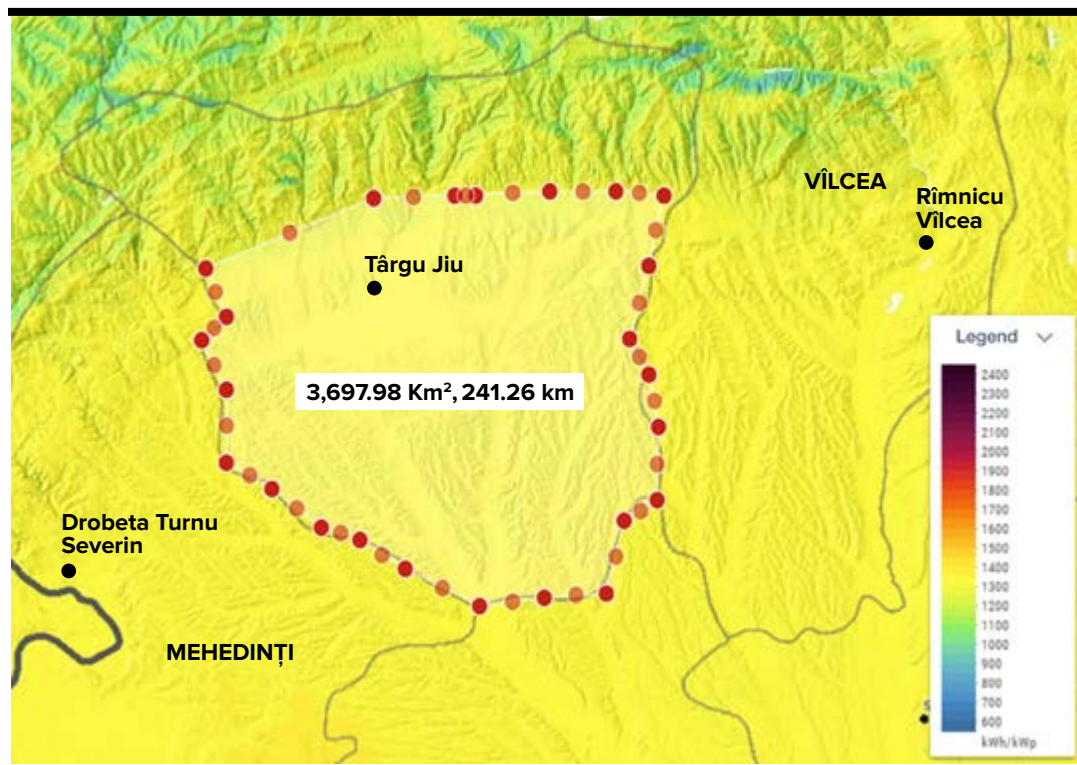
Area	PVOUT (kWh/kWp)	Photovoltaic parks PVOUT (kWh/kWp)
Motru	1,335	1,316
Târgu Cărbunești	1,319	1,297
Tismana	1,309	1,296
Bălești	1,322	1,303
Berlești	1,318	1,303
Aninoasa	1,316	1,295
Florești	1,326	1,305
Fântânele	1,326	1,309

Overall, due to the favourable landscape features, the central and southern part of Gorj County offer significant opportunities for the installation of new solar energy capacities. A geographical description of this area can be seen in Figure 4.

**Figure 4**

The region with the highest development potential for photovoltaic energy in Gorj County (kWh/kWp)

Source: Global Solar Atlas (2021)



Over 72.6% of this area of Gorj County has a PVOU value of over 1,335, i.e. a potential of photovoltaic energy comparable to the most favourable areas in the southern part of the South-West region, and even to areas in the South-East region of Romania.

Also, according to a study on the photovoltaic potential of coal regions in Europe, apart from the development of PV parks,<sup>9</sup> Gorj County also has a potential area of approximately 39 km<sup>2</sup> on which PV panel systems could be installed on rooftops. According to the study, this area could support a maximum installed capacity of about 3.4 GW. But, considering the favourable geography of Gorj County, prioritising investments in PV parks could produce higher yields, due to the economies of scale of this type of project, and also to the availability of land.



## 3.1.2 The potential for wind energy

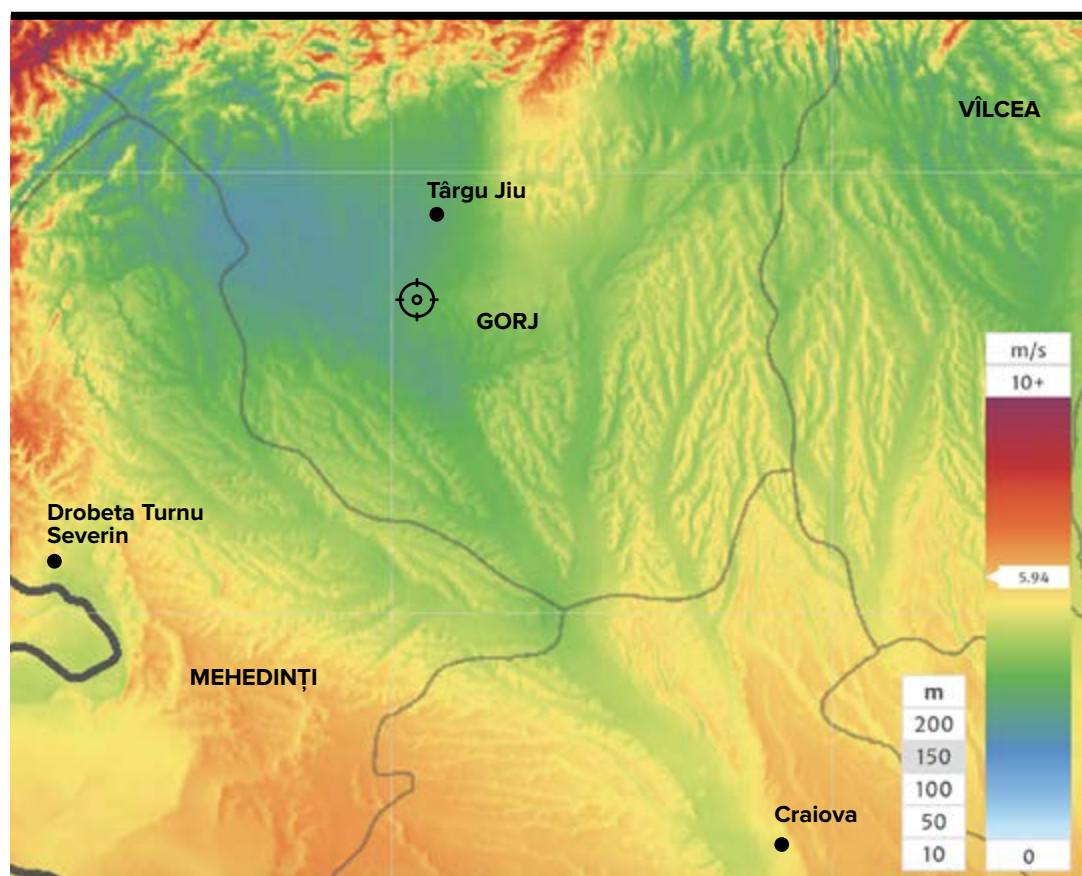


The South-West region also has a potential for wind farms, especially in the north of Gorj County, due to climatic factors that distinguish Gorj from the rest of the region: an average wind speed of 3.95-5.94 m/s at an average altitude of 150 m, but also a wind power density which is considerably above average (287-598 W/m<sup>2</sup> at an average altitude of 150 m). These values are shown in Figures 5 and 6, respectively.

**Figure 5**

Average wind speed  
in Gorj county (m/s)

Source: Global Wind Atlas (2021)



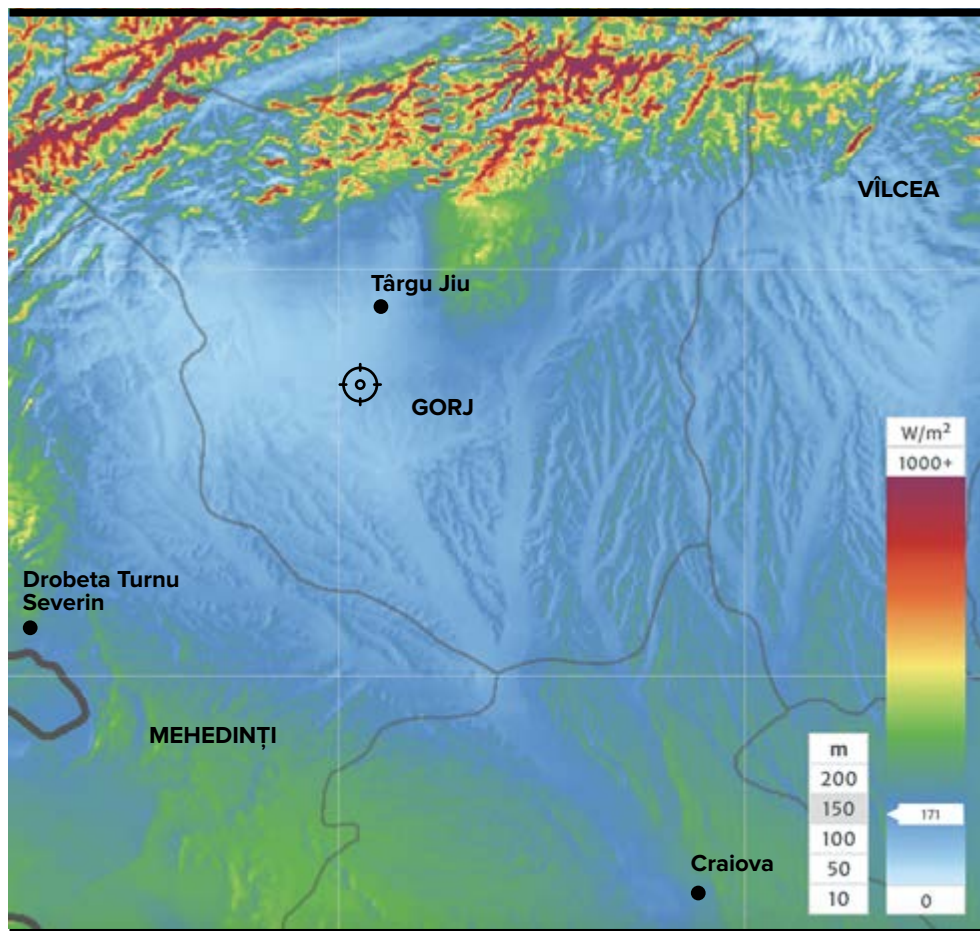
As in the case of solar energy, there are a number of areas within the county suitable for investments in wind energy. These zones exclude protected areas, already built-up areas and agricultural areas. They are located near localities such as Schela, Valea Mare, Călugăreni, Novaci, Baia de Fier or Radoşi. The surfaces available near these localities have high values both in terms of the average wind speed and of its density. The average wind speed at 150 m altitude in these regions can exceed 4 m/s, with the highest values close to 5.5 m/s.

Figure 7 highlights the area with the highest development potential for wind energy in Gorj County. Of course, nationally there are areas with higher wind potential. Therefore, according to the estimates in this study, due to the more favourable conditions in the region, the priority should be the large-scale development of the solar potential, along with some wind farms precisely located in areas of maximum potential, based on field measurements.

**Figure 6**

Wind Power Density in Gorj County (W/m<sup>2</sup>)

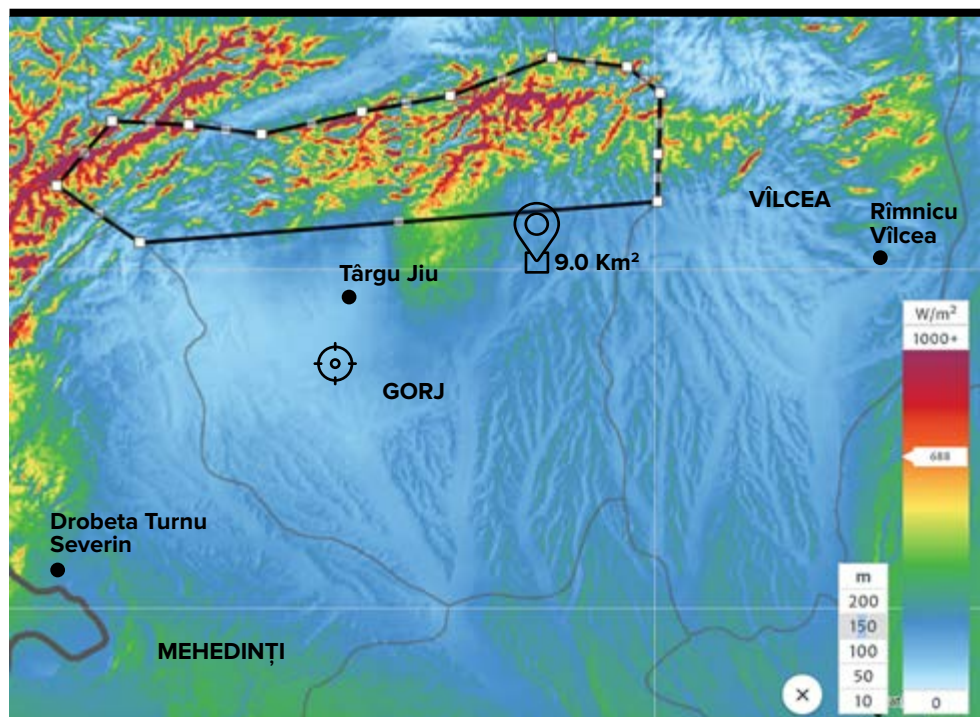
Source: Global Wind Atlas (2021)



**Figure 7**

The region with the highest wind power density in Gorj County (W/m<sup>2</sup>)

Source: Global Wind Atlas (2021)



### 3.1.3 Identifying areas with development potential for renewable energy



The energy potential of Gorj County relies, in addition to favourable climate conditions, on areas available for the development of wind or PV projects. Figure 8 provides an image of the areas available for this purpose (areas marked in green), excluding agricultural land already in use, forest areas and urban settlements.

**Figure 8**  
Surfaces available  
for renewable energy

Source: CORINE Land Cover (2021)



Close to areas with high potential for solar or wind energy in Gorj County, such as Bălești, Bumbescu-Jiu, Brănești or Tismana, there are lands for which access roads are already available (national roads or county roads), as well as utilities, such as connection to the electricity grid. A substantial part of these areas is owned by the administrative territorial units, and they can be used for developing renewable energy projects. Some of these lands are described in Table 6.

The surface areas showed in Table 6 were selected according to the average development potential for photovoltaic projects, but also because the land plots are owned by local authorities. The list is not fully comprehensive, as there are many other land plots located in the southern region of Gorj County, suitable for investments in solar energy.

Another opportunity for the development of medium and large photovoltaic parks is offered by the land owned by OEC, many of them located in the south of the county, in the region with the highest yield for solar energy. A description of the potential of these OEC lands is provided in Table 7.



Table 6 Land plots available in areas with high solar potential in Gorj

Source: Gorj County Council (2021); EPG calculation

Administrative territorial unit	Available surface areas	Access to land DN/DJ/DC/DS – national / county / commune / village road	Existing utilities near the land plot boundary	Estimated solar potential (MW)
ATU Brănești	2.88 ha	DC	Electricity and water	40.1
	6.05 ha	DS	Electricity and water	
	0.11 ha	DN	Electricity and water	
	0.78 ha	DN, DC	Electricity and water	
	1.15 ha	DN, DC	Electricity and water	
	0.08 ha	DJ	Electricity and water	
	0.44 ha	DJ	Electricity and water	
	0.30 ha	DC	Electricity and water	
	0.76 ha	DN	Electricity and water	
ATU Bălești	44.40 ha	DN, DJ	Electricity and water	
ATU Schela	85 ha	DJ	Electricity and water	
ATU Bumbăești-Jiu	1.7846 ha	Str. Gr. Alexandru Ghica	Electricity, gas, water, sewerage	142
	0.2146 ha	Str. Gr. Alexandru Ghica	Electricity, gas, water, sewerage	268
	54.5414 ha	DJ	Electricity, gas, water, sewerage	206
	0.2974 ha	DE	Electricity, gas, water, sewerage	
	5.7656 ha	str. Pleșa	Electricity, gas, water, sewerage	
	0.2515 ha	DJ	Electricity, gas, water, sewerage	
	0.1856 ha	DJ	Electricity and water	
	0.0770 ha	DJ	Electricity and water	
	2.3628 ha	DS	Electricity and water	
	0.2950 ha	DJ	Electricity and water	
	0.3174 ha	DS	Electricity and water	
	0.1350 ha	DJ	Electricity and water	

**Table 7**

OEC land plots available in areas with high solar potential in Gorj

Source: Gorj County Council (2021); EPG calculations

Administrative territorial unit	Available surface areas	PVOUT	Potential (MW)
Bălești	39 ha	1,322	124
Bălteni	210 ha	1,318	670
Brănești	2.85 ha	1,324	9
Drăguțești	119 ha	1,323	380
Fărcășești	954 ha	1,322	3,041
Turceni	715 ha	1,324	2,279
Rovinari	845 ha	1,320	2,293
Motru	7.6 ha	1,335	24

Overall, degraded land in the property of state-owned companies is a good opportunity to capitalise on photovoltaic potential. Examples of reconversion of mining areas are already available in Europe. For example, 16 MW of solar capacity has been installed in the Visonta area in Hungary, above former mining sites.<sup>10</sup> A similar model is currently implemented in some regions in Poland, such as 30 MW in the Bogdanka mining<sup>11</sup> area and 70 MW in the Adamów area.<sup>12</sup> For the latter example, the investment was made after signing a PPA-type agreement for a period of 15 years.

An estimate can also be made of the jobs that investments in renewable energy projects could create. Thus, developing a capacity of 750 MW of PV panels in the county, a realistic capacity considering the potential estimated in this chapter, would involve investments of approximately 525 million euro. According to a study conducted by EY for Solar Power Europe,<sup>13</sup> in Romania an average of 2.6 jobs are created for every MW installed. Consequently, 1,950 jobs could be created during the entire implementation of the projects for 750 MW, i.e. an average of 195 employees per year if the investments were carried out in 10 years.

10. Platform for Coal Regions in Transition (2019)

11. PV-Magazine (2019)

12. PV-Magazine (2019)

13. EY (2017)

## 3.2 Energy efficiency in existing buildings



In addition to capitalising on renewable energy sources, the renovation of buildings to increase energy efficiency is another prospect offered by the climate transition, with positive effects for the development of the county, especially if it involves the professional reconversion of labour needed for this economic activity, which is intrinsic to the European Green Deal.

Such investments not only reduce the energy consumption of end consumers, increasing financial household savings, but also contribute to improving the beneficiaries' living conditions and quality of life, as well as to stimulating economic activity locally and regionally. This section starts by presenting the situation of the building stock in the county and then provides an estimate of the costs related to the renovation of existing buildings in Gorj. Total renovation costs are estimated to be between 7 and 13 billion lei and can lead to total annual energy savings of up to 1,252 GWh.

The building renovation sector can make a major contribution in terms of jobs and can contribute to reducing the health care expenditures of the county's inhabitants. Models of best practices from other EU Member States show that improving the quality of life in transition regions is a key factor in regional social and economic development, especially in attracting and retaining human resources. As this study shows, deep renovation of the building stock can contribute to this objective.

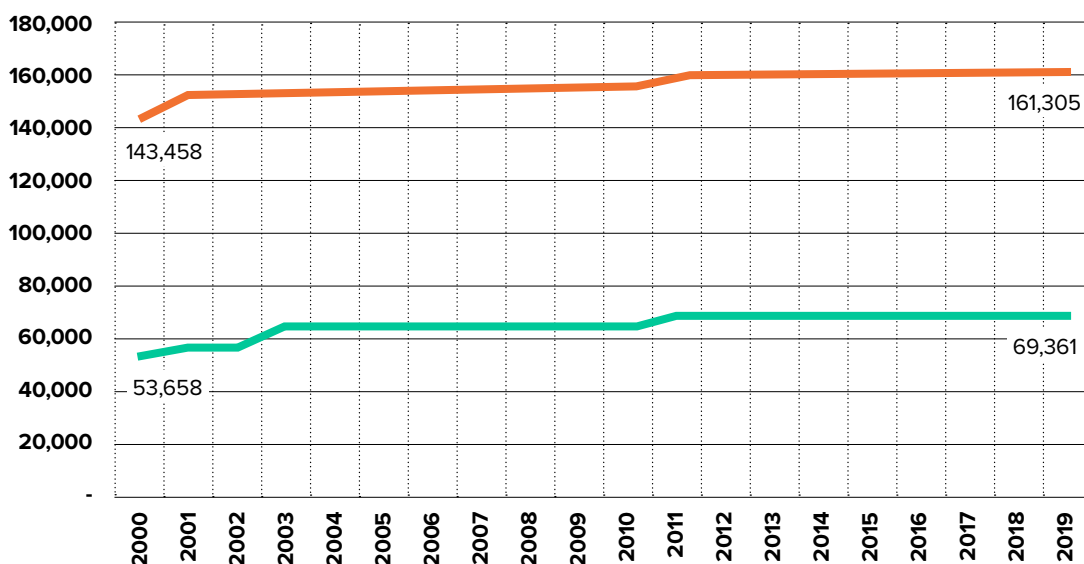
### 3.2.1 Status of the building stock in Gorj County

According to the INS, in 2019 there were 161,305 dwellings in Gorj County, of which 43% were located in urban areas. The evolution over time shows that of the 17,847 new dwellings – built after 2000 – 15,703 are in urban areas. In effect, the new dwellings were mainly built in towns and cities. The total number of dwellings increased by 12.4% in 2019 compared to 2000, while the number of dwellings in urban areas increased by 29.2% during the same period.

**Figure 9**  
The evolution of the number of dwellings in Gorj County

— Total  
— Urban

Source: INS Tempo online



The data available from INS show that in 1990 there were a total of 139,723 dwellings in Gorj County, i.e. 3,735 fewer than in 2000. Therefore, the development of the real estate sector occurred largely after the year 2000. In addition, one should note that the average surface area per home increased from 32.0 m<sup>2</sup> in 2000 to 43.2 m<sup>2</sup> in 2019.

It is worth noting that, although the number of dwellings increased by 12.4%, the average surface area increased by 35%, as the new dwellings have significantly larger areas than older ones, pointing to an improvement in the quality of living conditions in the county. In 2019, 247 dwellings were built with a total area of 46,861 m<sup>2</sup>, resulting in an average surface area of 190 m<sup>2</sup> per new home.

As far as the degree of energy efficiency of buildings is concerned, the latest information is only aggregated nationally. The Regional Development Plan of the South-West Oltenia Region for 2021-2027, using data from the 2011 Census, states that only 7.13% (11,362 dwellings) of the total dwellings in Gorj County had insulated exterior walls and only 0.07% (113 dwellings) had their roof waterproofed and thermally insulated. Therefore, the potential offered by the renovation of buildings in order to increase energy efficiency is extremely significant.

### 3.2.2 Estimate of the potential and costs of building renovation



Several methods can be used to approximate the number of dwellings requiring renovation. One estimate would be to consider that all dwellings built after 2000 do not require renovation, but in 2011, according to the Regional Development Plan of the South-West Oltenia Region for 2021-2027, only 709 dwellings were new and fully thermally insulated. That is 12.5% of the total of 5,677 dwellings built between 2000 and 2011.

The National Long-Term Renovation Strategy (SRTL) developed for the Ministry of Development, Public Works and Administration (MDLPA), published before the introduction of nZEB renovation standards, states that, at national level, the ratio of renovated residential buildings is 5%, and the ratio for those in the commercial and public sector is 9%.

The costs for the renovation of single-family dwellings are calculated in SRTL at 951 lei/m<sup>2</sup>, and those for apartments in blocks of flats with under 4 floors at 694 lei/m<sup>2</sup>.

The costs for single-family buildings are valid for the minimum renovation package (P1), so the result will be an energy performance close to class C of the EPC, as per technical regulations in force. For blocks of flats, costs are calculated for the P2 package, which involves deep renovation, but not nZEB.

Finally, for public buildings (schools, hospitals, administrative buildings) and commercial buildings (shops, hotels, restaurants) the maximum package P3 is proposed, which uses a deep renovation standard or nZEB, including options for renewable energy sources, such as PV on the roof, preparation of domestic hot water using solar energy or geothermal heat pumps. The costs are 1,664 lei/m<sup>2</sup> for hospitals, schools and 1,807 lei/m<sup>2</sup> for the other types (administrative and commercial buildings).

**Table 8**

Data on the renovation of buildings according to SRTL

Source: Long-Term Renovation Strategy

	Renovation package	Investment cost (lei/m <sup>2</sup> )	Renovated by 2020 (%)	Final energy reduction (kWh/m <sup>2</sup> /year)
Single-family dwellings	P1	951	3%	218
Blocks of flats (≤GF + 4 floors)	P2	694	7%	68
Educational institutions	P3	1,664	15%	117
Hospitals and other health care and social work services	P3	1,664	1%	117
Administrative, office, commercial buildings (hotels, restaurants, cafes, shops)	P3	1,807	8%	142

The data available from INS provide for Gorj County information only about the surface area of dwellings, not about the other types of buildings. To estimate the costs of renovating all buildings in the county, national averages regarding the surface areas of public and commercial buildings were used. Thus, the ratios for public and commercial areas available nationally were applied to the housing area of Gorj County. The result represents the estimated area of educational institutions, hospitals and social work centres, as well as administrative, office, and commercial buildings (hotels, restaurants, cafes, shops).

From this area, the area renovated until 2020 was then deducted using the national average. The resulting area was then multiplied by the rate per square metre estimated by the World Bank within SRTL. The result is an estimate of the total renovation costs for the buildings in Gorj County: **7 billion lei**.

**The amount of 7 billion lei represents three quarters of the annual turnover of Gorj County. This calculation, however, is a conservative one for several reasons:**

1. The costs are not estimated for a nZEB renovation standards of individual houses and apartments, categories representing over 80% of the total renovation costs.
2. Given that only 709 dwellings were completely insulated in 2011, it is quite likely that the national average for the percentage of renovated areas could be significantly higher than the real percentage of renovations in Gorj County. Secondly, the national average does not refer to deep renovations. The annual percentage of deep renovations in Romania was estimated by the European Commission at 0.1% for residential buildings and 0.4% for non-residential ones.
3. The renovation costs per square meter are specific to the year when the analysis was performed by the World Bank, namely 2019. Therefore, the result is strongly dependent on the evolution of prices for building materials and labour costs.
4. The launch of a “Renovation Wave” in Romania, also supported by the allocations from the National Recovery and Resilience Plan (NRRP) and from the financial instruments of the European Green Deal (e.g. the Modernisation Fund and the Just Transition Fund) would predictably lead to a massive increase in the demand for materials and skilled labour in the renovation sector, with an increasing pressure on prices.

Considering these clarifications, one can state that the cost of renovating the buildings in Gorj County will exceed **7 billion lei**, or will even exceed the county’s total annual turnover.

Thus, adjusting this amount by a 15% coefficient<sup>14</sup> to reflect the overall increase in prices in the building materials market between 2019 and the beginning of 2021, this results in a current total of **8.05 billion lei**. At the same time, according to the report *Clean energy technologies in coal regions*<sup>15</sup>, the costs of a renovation specific to the nZEB standards in Romania are estimated at 425 euro/m<sup>2</sup> in the case of individual houses and 230 euro/m<sup>2</sup> in the case of apartment blocks. At an exchange rate of 4.9 lei/euro, for Gorj county would result a total amount necessary for renovation of **13.18 billion lei**. Consequently, compared to the calculation based on SRTL data, the price increase can vary between 15% and 85%. Undoubtedly, European funds will have to represent the main source of funding.






Also based on the data from SRTL, the amount of energy saved after renovation can be calculated: every year 1,252 GWh would be saved in Gorj County if all the buildings were renovated. This energy is the equivalent of a power plant with an installed capacity of 150 MW (for example Paroşeni) that would continuously operate at maximum capacity, all year round, or of 300 MW (Işalniţa) that would operate 4,000 hours per year at maximum capacity. The average installed capacity of the coal-fired power plant units was 215 MW in 2015 and the operating time at maximum capacity was 3,700 hours.

14. The coefficient was calculated within the *Efficient Romania programme* deployed by EPG and dedicated to increasing the energy performance of buildings, without including the boom in prices recorded especially in Q2 of 2021.

15. Clean energy technologies in coal regions, JRC (2020)

**Table 9****Total costs for renovation of existing buildings**

Source: EPG calculations based on data from SRTL, Regional Development Plan of the South-West Oltenia Region for 2021-2027, INS

<b>Individual houses</b> 	Estimated area (m <sup>2</sup> )	5,022,630
	Area renovated by 2020 (%)	4.6%
	Area to be renovated (m <sup>2</sup> )	4,791,857
	Renovation cost (mil. lei)	4,557
<b>Apartment blocks</b> 	Estimated area (m <sup>2</sup> )	1,942,108
	Area renovated by 2020 (%)	7.0%
	Area to be renovated (m <sup>2</sup> )	1,806,160
	Renovation cost (mil. lei)	1,253
<b>Educational institutions</b> 	Percentage of dwellings	3.0%
	Estimated area (m <sup>2</sup> )	209,320
	Area renovated by 2020 (%)	15.0%
	Area to be renovated (m <sup>2</sup> )	177,922
	Renovation cost (mil. lei)	296
<b>Hospitals and other health care and social work services</b> 	Percentage of dwellings	1.6%
	Estimated area (m <sup>2</sup> )	110,880
	Area renovated by 2020 (%)	1.1%
	Area to be renovated (m <sup>2</sup> )	109,652
	Renovation cost (mil. lei)	182
<b>Administrative, office, commercial buildings (hotels, restaurants, cafes, shops)</b> 	Percentage of dwellings	6.1%
	Estimated area (m <sup>2</sup> )	421,511
	Area renovated by 2020 (%)	10.0%
	Area to be renovated (m <sup>2</sup> )	379,360
	Renovation cost (mil. lei)	686
<b>Total renovation costs (mil. lei)</b>		<b>6,975</b>

Additionally, the impact of renovating the buildings will be significant on the labour market. Such an ample process requires a substantial increase in the number of workers in the construction and engineering services sector (energy audits for buildings, technical projects, construction monitoring, etc.). According to the IEA,<sup>16</sup> an average of 14.8 jobs are created for every million dollars invested in building renovations. Thus, in the case of the 7 billion lei, at an exchange rate of 4.15 lei/USD, the result would be about 25,000 jobs throughout the renovation process, i.e. an average of 1,030 employees per year if the amount is spent in 25 years.

The SRTL estimates the benefits generated by increasing the quality of life derived from improving living conditions. The major advantages come from heating, ventilation, and thermal insulation. Temperature regulation, ventilation, humidity regulation, low fuel use, the surface area and orien-





tation of windows are key factors in reducing the risks of having a too cold or too hot environment, air pollution and related health risks.

Thus, for the scenario recommended in SRTL, the direct annual savings related to the provision of health services due to the renovation of buildings were estimated at about 69 million euro, while the total annual value of health-related social benefits is estimated at 1,480 million euro.

Adjusting these values to the situation of Gorj County, at a similar renovation rate until 2030, corresponding to a surface area of 1.4 million m<sup>2</sup>, the total annual value of health-related social benefits is estimated at 22.15 million euro.



# 4. Identifying the economic sectors with the greatest development opportunity





While developing renewable resources and the renovation of existing buildings may be measures with potential for short- and medium-term implementation, this study aims at identifying certain long-term economic development directions for Gorj County, especially in the context of the energy and climate transition across Europe. Thus, apart from identifying value chains for advanced technologies, this chapter submits an analysis of the current economic situation in Gorj County in order to identify development opportunities at local level. **One sector that stands out with a high profit rate is construction, the fourth largest employer in the county.** The NACE division-level analysis indicates a significant increase of the profitability of companies in this sector in the past 10 years. In fact, almost the entire value chain specific to the construction section is already present in the county, which can be used for the renovation of buildings both in Gorj and in neighbouring counties.

At the same time, one may notice that currently the most active economic section is the production of electricity, represented by the activity of OEC, which accounts for about one third of the county's turnover and number of employees (29%). The analysis of OEC, as well as that of the companies dependent on it for a good share of their turnover, shows that 14,152 employees, representing 18.2% of the total number of employees in the county, are closely related to OEC's activity. The company's activity, however, generates major losses and deep restructuring is needed to reduce carbon emissions, which entails the phasing out of lignite-based electricity production. But the breakdown of employees by fields of activity shows that over half of those employed by companies heavily dependent on OEC work in, or could quite easily make the transition towards, the fields of metal structures or housing construction, if these economic sections develop in the county.

In addition, this section also provides an analysis of the exports of companies based in the county, in order to identify economic operators with a high level of competitiveness in international markets. Standing out in this respect are the economic activities in the field of rubber and rubber products, nuclear reactors, boilers, machines and mechanical devices, as well as furniture and lighting fixtures.

Last but not least, this section provides a brief analysis of the educational profile of the vocational schools in the county. We can notice the emphasis on the technical profile, with students trained in mechanics, automation and electronics, electromechanics and electrical engineering, as well as in construction and installations. They cover a wide range of basic technical fields and match the value chains identified in Chapter 4. Additionally, one of the major competitive advantages of Gorj County in attracting value chains is represented precisely by the human resources required in the industry that is undergoing the process of transition towards climate neutrality. Besides technicians with mechanical or electrical specialisation, whose skills can be easily transferred to the value chains of clean technologies, in Gorj County there are a large number of power engineers, electrical and mechanical engineers who can use their knowledge and skills in production, installation or operation and maintenance activities.

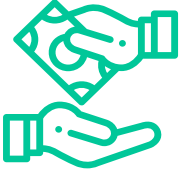
## 4.1 NACE Sections

In 2019, the most active section of the economy was electricity production (OEC and 15 other companies), which had the highest turnover (35% of the total turnover in Gorj County) and the highest number of employees (29% of the overall number of employees in the county). The whole section includes 16 companies, among which OEC stands for almost the entire turnover and number of employees. But the sector is not financially sustainable. OEC registered losses of 863 million lei, that is 28% of its turnover.

Table 10 Indicators of companies in Gorj County in 2019, by NACE sections

Source: Ministry of Finance

2019 reference level				
NACE Sections Rev. 2	Turnover (million lei)	Employees	Net profit (mil. lei)	No. of companies
A – Agriculture, forestry and fishing	155.77	798	15.1	252
B – Mining and quarrying	107.04	345	13.6	35
C – Manufacturing	953.21	6,546	83.6	809
D – Production and distribution of electricity and heat, gas, hot water and air conditioning	3,175.82	13,037	6.4	16
E – Water supply; sewerage, waste management and remediation activities	161.75	1,655	13.9	96
F – Construction	565.13	3,079	79.3	846
G – Wholesale and retail trade; repair of motor vehicles and motorcycles	2,465.94	7,546	157.2	3,338
H – Transportation and storage	585.93	2,755	56.0	945
I – Hotels and restaurants	211.44	1,672	40.4	614
J – Information and communications	64.27	418	14.9	240
K – Financial and insurance activities	30.77	270	15.8	159
L – Real estate activities	38.83	178	17.0	131
M – Professional, scientific and technical activities	144.56	1,768	37.7	712
N – Administrative and support service activities	159.35	3,030	18.0	270
O – Public administration and defence; compulsory social security	31.51	1	0.2	3
P – Education	9.00	199	2.4	70
Q – Human health and social work activities	88.89	772	30.9	294
R – Arts, entertainment and recreation	84.78	273	12.0	208
S – Other service activities	34.92	455	6.8	319
<b>TOTAL</b>	<b>9,068.92</b>	<b>44,797</b>	<b>621.2</b>	<b>9,357</b>



Ranking second is trade, a section that represents 17% of the total number of employees in the county and 27% of its turnover. Unlike the previous section, trade turned a consistent profit, the highest in absolute terms among all sections of the economy. In relative terms, trade brings in 25% of all profits recorded in the county. The largest number of companies operate in this field, the 3,338 companies representing more than one third of all businesses in the county.

The manufacturing industry employs 6,546 people, ranking third in the county both in terms of the number of employees and turnover. While the 809 companies create the impression of a great competition, the average profit is 9% of the turnover.

With an even higher rate of profit is the construction sector, the fourth largest employer in the county. In 2019 the 3,079 employees created a profit of almost 80 million lei, i.e. 14% of the total turnover. The transports sector, similar in number of employees and turnover to construction, has a lower profitability, 10% of the turnover.

The graph on the evolution of the sections of economy indicates the reorganisation of OEC in 2012, when about 8,000 employees moved from the mining sector to the production and supply of electricity. This accounts for the 96% decrease in the number of employees in the mining field and the 42% increase in energy production.

Trade and manufacturing lost employees, but increased their profitability. Construction registered a small decrease in the number of employees, but a six-fold increase in profitability. Transportation had major increases in all indicators that were analysed, especially in net profit – an almost nine-fold increase.

The largest increases in the number of employees and companies, as well as in profitability were in services, with a low turnover: culture, education, health and social work.

Also, the section *Public administration and defence; compulsory social security* stands out by a 527 times increase in turnover. A more detailed analysis reveals that it involves Minprest Serv SA, a company registered with a NACE code for *Fire Fighting and Fire Prevention Activities* and which provides services mainly for OEC.

The threefold increase in the number of employees in the *Professional, Scientific and Technical Activities* section can be explained by the establishment of several companies in this sector, but especially by the establishment of Moveos SRL in 2017, which had 866 employees in 2019.

Hotels and restaurants have almost doubled their turnover in the ten years under analysis. The number of employees remained constant, although 80 new companies were established, but the profit increased 8 times. All this demonstrates that these businesses have managed to substantially optimise their activity. Profit is 19% of the turnover.

Table 11 The evolution of indicators for the companies in Gorj between 2010 and 2019

Source: Ministry of Finance; EPG calculations

<b>Evolution 2019 compared to 2010</b>				
<b>NACE Sections Rev. 2</b>	<b>Turnover</b>	<b>Employees</b>	<b>Net profit</b>	<b>No. of companies</b>
A – Agriculture, forestry and fishing	118%	54%	396%	21%
B – Mining and quarrying	-89%	-96%	296%	-15%
C – Manufacturing	12%	-29%	278%	28%
D – Production and distribution of electricity and heat, gas, hot water and air conditioning	72%	42%	4%	33%
E – Water supply; sewerage, waste management and remediation activities	-15%	7%	32%	13%
F – Construction	82%	-7%	527%	31%
G – Wholesale and retail trade; repair of motor vehicles and motorcycles	65%	-11%	257%	6%
H – Transportation and storage	142%	50%	773%	59%
I – Hotels and restaurants	92%	-1%	690%	15%
J – Information and communications	108%	5%	452%	57%
K – Financial and insurance activities	33%	-9%	127%	23%
L – Real estate activities	112%	16%	698%	66%
M – Professional, scientific and technical activities	246%	197%	311%	73%
N – Administrative and support service activities	92%	-29%	328%	49%
O – Public administration and defence; compulsory social security	2.629%	0%	960%	200%
P – Education	256%	51%	1473%	150%
Q – Human health and social work activities	339%	75%	1440%	107%
R – Arts, entertainment and recreation	334%	163%	3244%	259%
S – Other service activities	165%	0%	689%	103%
<b>TOTAL</b>	<b>43%</b>	<b>-13%</b>	<b>338%</b>	<b>29%</b>

## 4.2 NACE Divisions

For more detail, the data were analysed at a lower level of aggregation, by NACE divisions. The table below lists, in descending order by the number of employees, the top twenty NACE divisions. These are all the divisions including over 400 employees in 2019.

In the top positions are the production and distribution of electricity (mainly OEC), trade, transportation, security and protection. It is only in the 6th position that we find the construction of buildings. Ranking 7th are metal structures, with 1,440 employees. It is worth mentioning that more than half of the employees (820) work at Uzina Mecanică Sadu, a subsidiary of Romarm SA. In 2019 there was only one other company having over 100 employees, but it was bankrupt.

In that list, the division Manufacture of rubber and plastic products also draws attention. A large part of the employees belong to Artego SA, a manufacturer of conveyor belts and other rubber products.

Regarding the evolution per NACE division, the most favourable evolutions of the number of employees were in transports, security and protection, technical testing and analyses – it mainly includes the evolution of Moveos SRL, mentioned above.

All three divisions in the construction industry rank among the top 20. Overall, the number of employees has decreased, but there is a massive increase in profitability:

- sixfold for the construction of buildings;
- fivefold for special construction works (electrical installations, plumbing and heating installations, carpentry and joinery works, drilling and boring works for constructions, land preparation works);
- almost tenfold in the case of civil engineering works (road construction, utility construction for electricity and telecommunications).

There are many industry-specific divisions, but only five of them are on the top 20 list.

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**Based on analysing the evolution of the main indicators, it can be stated that the most successful economic sections are transports, education, healthcare, entertainment and cultural activities, security and protection services – but these cannot be the main activity of the county, their part is rather that of support role for the basic economic areas.**

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From an economic point of view, the performance of a sector is measured by its profitability, more by the increase in turnover and less by an increase the number of employees. Analysing the evolution of the main indicators, it can be stated that **the construction sector has had very good progress and still has very high potential.** Profitability has increased sixfold, and turnover increased by 82% in the last decade. The profit per turnover ratio is very high: 14%. **As a result of funding for the renovation of buildings that will be made available through NRRP and, most likely, through the Modernisation Fund and the Just Transition Fund, the demand in this field will increase substantially.**

Almost the entire value chain specific to the construction section is present in the county. Upstream in this chain are mining for sand, gravel, stone, the manufacture of concrete and concrete products, the manufacture of bricks and precast products made of concrete and plaster, the manufacture of doors and windows, the manufacture of plastic products for construction, the manufacture of other carpentry and joinery elements for construction. Secondly, in 2019 the companies specialising in construction of residential and non-residential buildings had 1,582 employees. In addition to those there are workers performing electrical, plumbing, heating and air conditioning works, painting and flooring, etc., then architectural services and civil engineering works (roads, railways, utility construction for electricity and telecommunications, construction of water projects). Similarly, the metal structures and metal products industry has growth potential, considering the high value of exports in 2020 (44 million lei), but also the fact that local demand will increase at the same time as the construction sector.

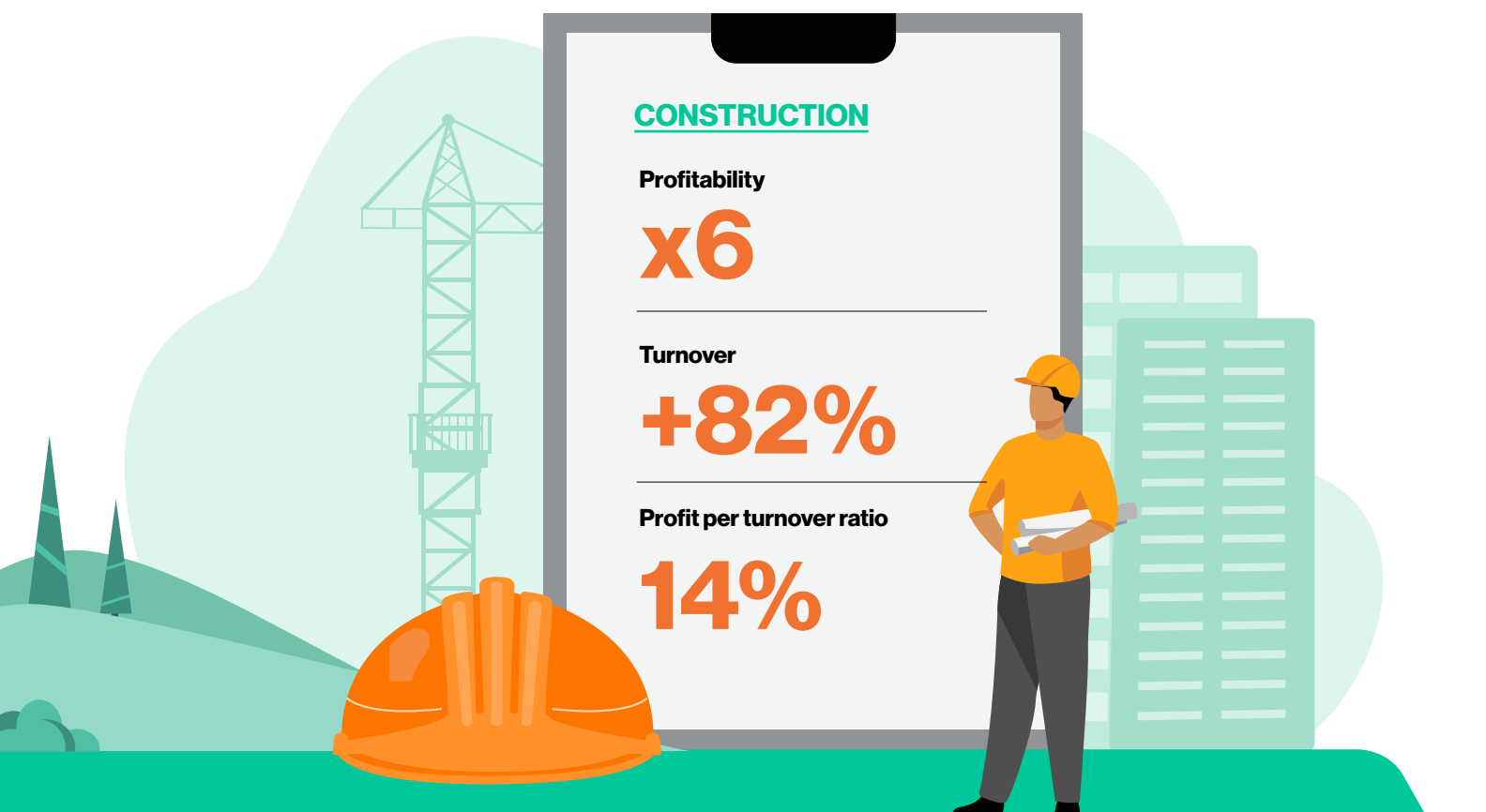




Table 12 Indicators of companies in Gorj County in 2019, in the top 20 divisions of NACE sections, by number of employees

Source: Ministry of Finance

2019 reference level				
NACE Sections Rev. 2	Turnover (million lei)	Employees	Net profit (mil. lei)	No. of companies
Production and distribution of electricity and heat, gas, hot water and air conditioning	3,175.8	13,087	6.4	16
Retail trade, except for motor vehicles and motorcycles	1,469.2	4,826	90.7	2,449
Land transport and transport via pipelines	568.7	2,564	53.2	905
Security and investigation activities	91.3	2,509	7.7	24
Wholesale trade, except for motor vehicles and motorcycles	869.3	1,962	48.9	510
Construction of buildings	237.5	1,590	38	494
Manufacture of metal structures and metal products, except for machinery, equipment and installations	140.4	1,440	5.4	103
Food and beverage service activities	168.7	1,307	29.1	447
Architectural and engineering activities; technical testing and analysis	91.2	1,186	19.3	222
Manufacture of food products	185.4	1,175	14.6	176
Manufacture of rubber and plastic products	226.0	1,097	14.6	54
Waste collection, treatment and disposal activities; recyclable materials recovery	101.6	1,007	9.4	82
Specialised construction activities	177.9	967	21.0	297
Wholesale and retail trade, maintenance and repair of motor vehicles and motorcycles	127.5	7587	17.6	379
Human health activities	87.9	757	30.8	285
Manufacture of wearing apparel	46.0	747	3.7	65
Forestry and logging	114.1	654	9.8	147
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	88.4	652	4.1	117
Water collection, treatment and supply	58.7	643	4.4	13
Civil engineering works	149.8	532	20.2	55

**Table 13** The evolution of indicators for companies in Gorj County between 2010 and 2019, in the top 20 divisions of NACE sections, by number of employees

Source: Ministry of Finance; EPG calculations

<b>Evolution 2019 compared to 2010</b>				
<b>NACE Sections Rev. 2</b>	<b>Turnover</b>	<b>Employees</b>	<b>Net profit</b>	<b>No. of companies</b>
Production and distribution of electricity and heat, gas, hot water and air conditioning	72%	42%	4%	33%
Retail trade, except for motor vehicles and motorcycles	83%	-20%	274%	3%
Land transport and transport via pipelines	140%	43%	751%	57%
Security and investigation activities	311%	57%	541%	41%
Wholesale trade, except for motor vehicles and motorcycles	45%	16%	196%	-2%
Construction of buildings	75%	4%	499%	53%
Manufacture of metal structures and metal products, except for machinery, equipment and installations	-10%	-35%	110%	5%
Food and beverage service activities	119%	-4%	622%	0%
Architectural and engineering activities; technical testing and analysis	475%	434%	730%	85%
Manufacture of food products	-18%	-30%	387%	17%
Manufacture of rubber and plastic products	40%	-15%	477%	54%
Waste collection, treatment and disposal activities; recyclable materials recovery	-39%	-2%	31%	2%
Specialised construction activities	72%	-9%	399%	10%
Wholesale and retail trade, maintenance and repair of motor vehicles and motorcycles	39%	2%	436%	52%
Human health activities	334%	71%	1431%	102%
Manufacture of wearing apparel	91%	-27%	350%	63%
Forestry and logging	208%	83%	324%	26%
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	41%	26%	-34%	22%
Water collection, treatment and supply	161%	22%	32%	225%
Civil engineering works	107%	-27%	874%	2%

Table 14 Indicators of companies in Gorj County in 2019, in NACE divisions belonging to the manufacturing industry

Source: Ministry of Finance

2019 reference level				
NACE Rev. 2 Divisions in Section C – manufacturing industry	Turnover (million lei)	Employees	Net profit (mil. lei)	No. of companies
Manufacture of metal structures and metal products, except for machinery, equipment and installations	140.4	1,440	5.4	103
Manufacture of food products	185.4	1,175	14.6	176
Manufacture of rubber and plastic products	226.0	1,097	14.6	54
Manufacture of wearing apparel	46.0	747	3.7	65
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	88.4	652	4.1	117
Manufacture of other non-metallic mineral products	67.7	357	10.2	65
Repair, maintenance and installation of machinery and equipment	36.8	272	6.3	20
Manufacture of furniture	20.7	165	2.5	48
Manufacture of machinery and equipment n.e.c.	49.3	151	8.0	20
Manufacture of electrical equipment	37.2	132	2.6	12
Manufacture of textiles	7.8	128	2.7	28
Printing and reproduction of recorded media	21.4	98	1.6	28
Other manufacturing n.e.c.	4.6	46	1.4	36
Manufacture of chemicals and chemical products	3.7	24	1.1	8
Manufacture of paper and paper products	6.6	21	0.3	6
Manufacture of computers and of electronic and optical products	2.9	14	1.2	7
Manufacture of other transport equipmen	6.4	11	2.6	2
Manufacture of coke and refined petroleum products	1.5	11	0.4	4
Manufacture of beverages	0.4	5	0.0	8

**Table 15** The evolution of indicators for the companies in Gorj between 2010 and 2019 in NACE divisions belonging to the manufacturing industry

Source: Ministry of Finance; EPG calculations

<b>Evolution 2019 compared to 2010</b>				
<b>NACE Rev. 2 Divisions in Section C – manufacturing industry</b>	<b>Turnover</b>	<b>Employees</b>	<b>Net profit</b>	<b>No. of companies</b>
Manufacture of metal structures and metal products, except for machinery, equipment and installations	-10%	-35%	110%	5%
Manufacture of food products	-18%	-30%	387%	17%
Manufacture of rubber and plastic products	40%	-15%	477%	54%
Manufacture of wearing apparel	91%	-27%	350%	63%
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	41%	26%	-34%	22%
Manufacture of other non-metallic mineral products	83%	-7%	5.545%	18%
Repair, maintenance and installation of machinery and equipment	-26%	-15%	401%	43%
Manufacture of furniture	18%	-69%	570%	60%
Manufacture of machinery and equipment n.e.c.	-26%	-80%	134%	18%
Manufacture of electrical equipment	104%	40%	140%	-29%
Manufacture of textiles	214%	28%	8,712%	133%
Printing and reproduction of recorded media	150%	8%	568%	33%
Other manufacturing n.e.c.	234%	5%	6,570%	200%
Manufacture of chemicals and chemical products	93%	50%	7,220%	14%
Manufacture of paper and paper products	67%	-40%	132%	120%
Manufacture of computers and of electronic and optical products	491%	75%	2,301%	133%
Manufacture of other transport equipmen	13,241%	-	9,985%	100%
Manufacture of coke and refined petroleum products	903%	120%	-	300%
Manufacture of beverages	-80%	-95%	447%	-20%

## 4.3 Analysis of the evolution of OEC and companies dependent on OEC

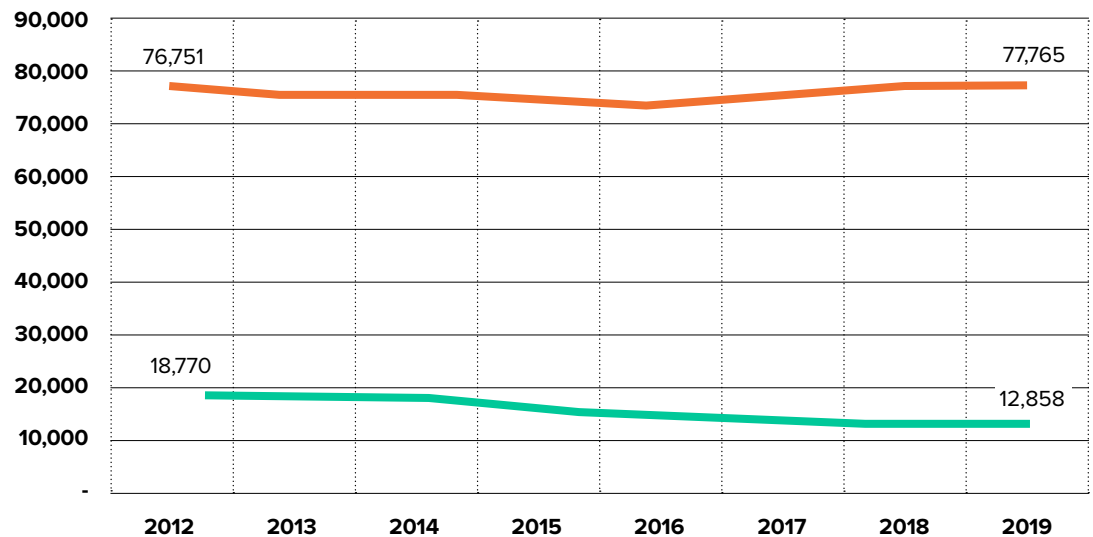
According to the Ministry of Finance, the companies that submitted their balance sheet for 2019 had 44,797 employees. However, this number does not include employees in the public education system, healthcare, and public administration. The total number of employees in Gorj, according to INS, was 77,765 at the end of 2019. The INS classification is based on statistical survey and does not take into account the NACE codes declared by companies.

**Figure 10**

The evolution of the number of employees

— Gorj total  
— OEC

Source: INS, Ministry of Finance



According to the financial records submitted in 2020, in 2019 the company Complexul Energetic Oltenia S.A. (OEC) had 12,858 employees. Their number decreased every year compared to the year of its establishment – 2012, when there were 18,770 employees.

Of the 12,858 employees in 2019, 7,596 (almost 60%) work in the mining sector. According to data provided by the company, in 2020 their number decreased to 6,238, while the total number decreased to 12,268 employees. We must add to this the number of employees in companies heavily dependent on OEC. We consider a company is heavily dependent on OEC if the share of contracts with OEC in their total turnover between 2017-2019 is over 50%. There are a total of 18 such companies, having 763 employees. Thus, the employees of OEC and of the dependent companies amounted to 13,621 people in 2019, i.e. 17.5% of the number of employees in Gorj County.

Most of them already carry out general activities, which can be transferred to other companies or the population. Only TPSUT Motru SRL and Unitatea de Execuție Foraje Motru S.A. have a more OEC-oriented specialised activity, but they could also make the transition to the construction sector. The breakdown of employees by fields of activity shows that over half of those employed by companies heavily dependent on OEC work in, or could quite easily make the transition towards, the fields of metal structures or housing construction.

Table 16 Companies heavily dependant on OEC<sup>17</sup>

Source: Ministry of Finance; OEC; EPG calculations

Single Registration Number	Name	NACE CODE	Turnover 2017-2019	Share of OEC contracts in the total turnover 2017-2019	No of. employees 2019
13695759	VALCAS SRL	4931	3,062,381	290%	1
156759	EXPRES TRANSPORT SA	4939	19,295,432	157%	82
14488808	TPSUT MOTRU SRL	4399	129,930,832	119%	97
9882295	CAZARE CANTINE SA	5629	2,856,839	116%	8
28435323	DEMIPED TRANS SRL	4941	189,700	106%	1
14814475	MEDSERV MIN SA	8690	12,652,359	100%	97
14814483	MINPREST SERV S A	8425	87,593,652	98%	0
2161577	SESAM SRL	4321	1,245,612	96%	6
37556227	UZITMET INDUSTRY SRL	2511	42,023,399	94%	145
14521289	UNITATEA DE EXECUTIE FORAJE MOTRU S.A.	4313	10,830,078	92%	72
34857420	CHIMINERGOIL 2015 SRL	4612	1,534,723	88%	1
2160520	PRELMET SA TG-JIU	2511	4,704,168	85%	16
2575684	AMVALOVI SRL	4120	25,102,179	73%	37
3846455	IRIS C&V SRL	4931	11,013,999	71%	26
34089666	PORTAL PROTECTION GROUP SRL	8010	5,906,608	61%	79
8821761	ARMEANCA PREST COM S.R.L.	2399	63,725,200	60%	80
40068790	COSMOPRIME INDUSTRY SRL	4669	583,165	55%	0
21434657	ECATECH SERV SRL	2511	5,683,466	52%	15

17. OEC contracts stand for over 50% of the total turnover.

**Table 17**

Breakdown of employees by fields of activity in companies heavily dependent on OEC

Source: NTRO; EPG calculations

Field of activity	No of. employees in 2019
Construction of buildings	292
CMetal structures	176
Passenger transport	109
Medical services	97
Private security activities	79
Food and beverage	8
Trade	1
Freight transport	1
Cleaning services	0
<b>Total</b>	<b>763</b>

17 more companies have exposure to OEC's activity, but to a lesser extent, with the share of OEC contracts in their total turnover for 2017-2019 being between 25% and 50%. Overall, they have 1,402 employees, most of them from Artego SA, one of the largest manufacturers of rubber products in the country.

Artego SA has the largest number of employees on the list and is active in a very narrow niche, providing OEC mostly with rubber conveyor belts. Only a quarter of the turnover consists of orders delivered to OEC. At the same time, Artego SA's products are very competitive in the foreign market, almost 60% of production being exported.

Another exceptional situation is that of Trefo SRL, which mainly provides OEC with equipment for coal mining and processing. The other companies provide products and services that can be sold to other companies in the county or to the population. If we also take into account these employees, except for those from Artego SA, the number of employees in OEC and in companies that are dependent on them in proportion of over 30% is 14,152, i.e. 18.2% of the total number of employees in the county.



Table 18 Companies with medium dependence on OEC<sup>18</sup>

Source: Ministry of Finance; OEC; EPG calculations

Single Registration Number	Name	NACE CODE	Turnover 2017-2019	Share of OEC contracts of the total turnover 2017-2019	No. of employees 2019
9359793	TREFO SRL	2892	20,146,901	44%	44
18273860	SIGNOVINCE SRL	8010	20,918,313	43%	227
6513684	CONSULTING COMPANY	7022	1,009,045	42%	6
41346100	ARHIMANIAC PROJECT SRL	7111	516,404	41%	1
22312526	GABICOST COM SRL	4939	3,324,817	41%	8
34261760	PRO AUTO A & A SRL	4532	3,789,775	39%	5
14060088	ROMFEREX IMPORT EXPORT SRL	4941	25,092,997	37%	42
22513678	TEST BACK SRL	7120	132,956	37%	5
8583694	FRIGOTEHNICA SRL	4322	2,264,067	36%	5
18165656	EUROHOD TOUR SRL	4931	8,469,841	36%	20
28385152	CATAMOTZ CONS SRL	4120	833,828	35%	4
8739654	SLAVYA CONSTRUCT SRL	4120	7,290,704	34%	17
23551998	TOPO EARTH SRL	7112	690,658	34%	1
17405866	J&R CAR SRL	4931	38,325,489	33%	145
5973234	HG CHIMICS SRL	5811	276,082	30%	1
2157428	ARTEGO SA	2219	483,898,806	26%	870
16012117	SPADISERV SRL	4322	387,541	26%	1

18. OEC contracts stand for 25%-50% of the total turnover.

**Table 19**

Breakdown of employees by fields of activity in companies with medium dependence on OEC

Source: NTRD;  
EPG calculations

Field of activity	No of. employees in 2019
Manufacture of rubber products	870
Private security activities	227
Passenger transport	173
Machinery for mining, quarrying and construction	44
Freight transport	42
Construction of buildings	27
Architectural and engineering activities	7
Management consultancy activities	6
Trade	5
Publishing activities	1

In terms of turnover, the share of OEC in the county's activity is much higher than that of the number of employees. The aggregated turnover of all companies in Gorj County in 2019 was 9 billion lei, and that of OEC was 3.1 billion, that is 34% of the total for the county.

In 2019, companies that are heavily dependent on OEC had a turnover of 173.2 million lei, while those with medium dependence (between 25%-50%), excluding Artego SA, had a turnover of 52.7 million lei. Together, OEC plus these companies amount to 3,342 million lei, i.e. 36.85% of the county's turnover.

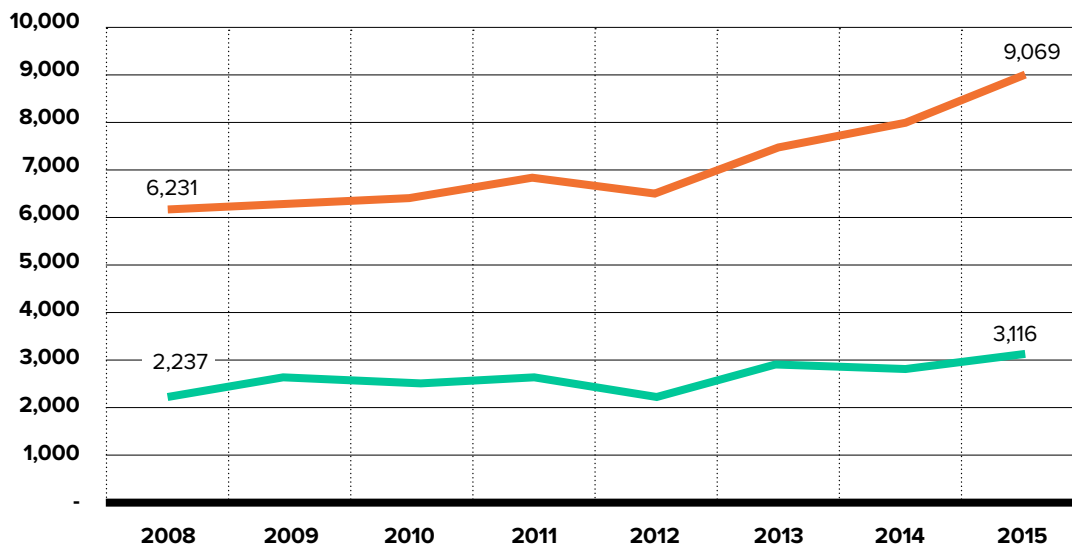
In terms of profitability, OEC has generally incurred losses in the last 8 years, especially in 2018 and 2019, when the loss represented one third of the turnover. Thus, while OEC generates a large proportion of Gorj County's turnover, its activity is highly unprofitable.

**Figure 11**

Evolution of turnover (mil.lei)

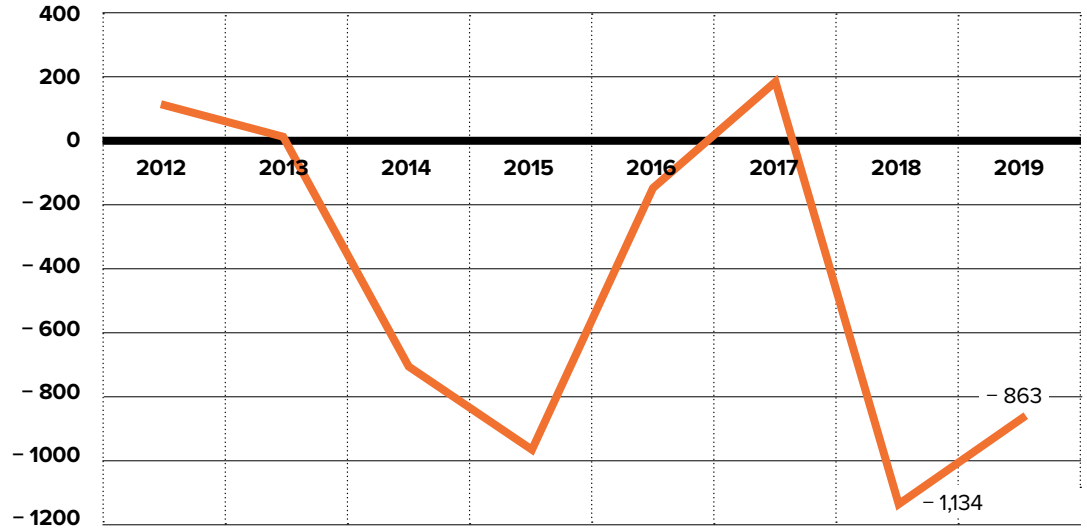
CA Gorj  
CA CEO

Source: Ministry of Finance



**Figure 12**  
Evolution of OEC's net profit (mil.lei)

Source: Ministry of Finance; OEC; EPG calculations

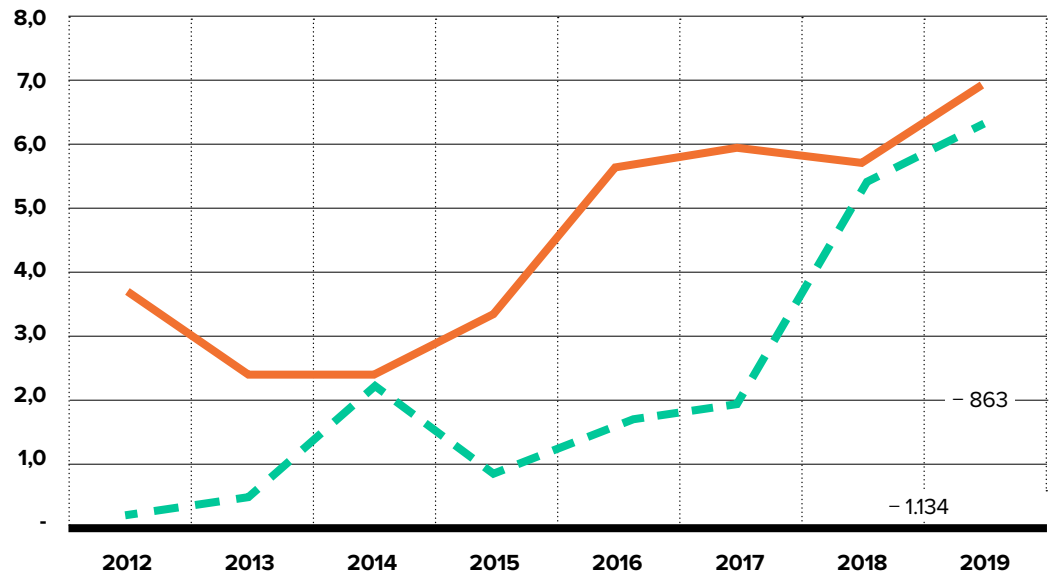


Companies heavily depending on OEC are in a similar situation. Combined, the loss almost equals the profit. A closer look shows that the loss of the last 2 years is due to TPSUT Motru SRL, the largest OEC-dependent company in terms of turnover.

**Figure 13**  
Evolution of the profit and loss for companies heavily dependent on OEC (mil. lei)

— Net income  
- - - Net loss

Source: Ministry of Finance



Uzimet Industry SRL, a company specialised in manufacturing metal structures, had the highest profit, of 3.6 million lei. Amvalovi SRL, a company operating in the construction of residential and non-residential buildings, had a profit of 1.2 million lei.

## 4.4 Analysis of exports for the companies in Gorj county

The study also includes the analysis of exports, since they show the competitiveness of that company/sector in the international market.

According to INS data, in 2020 Gorj County exported 80 million lei worth of rubber and rubber products.

**Table 20**

The main goods exported in 2020 by companies in Gorj County

Source: INS, Tempo online, EPG calculations

Chapters of the Combined Classification	Share in total exports, 2020	Value (million lei)
40. Rubber and rubber products	32%	79.9
84. Nuclear reactors, boilers, machines and mechanical devices	17%	43.9
94. Furniture; lighting fixtures and similar products (including components)	15%	37.6
07. Vegetables, plants, roots and tubers	11%	27.1
87. Cars, tractors and other land vehicles	8%	19.7
73. Cast iron, iron and steel products	3%	7.0
62. Clothing apparel and accessories, other than knitted and crocheted apparel	2%	6.0
44. Logs, timber, wood laminates and other wood products	2%	4.7
20. Processed vegetables and fruit	2%	4.1

The only company with a turnover over 1 million lei operating in this field is Artego SA. In 2019, its turnover was 181 million lei. In the same year, the county's export of rubber and rubber products amounted to 106 million lei. Over 58% of Artego's production was exported.

The export of nuclear reactors, boilers, machines, and mechanical devices was worth 44 million lei. The sector is quite vast and there are several companies that can fit in. In this case, it is more difficult to identify companies that have exported such products. It should be noted that the main category of imports was also nuclear reactors, boilers, machines and mechanical devices (39 million lei), so the exported goods may be produced locally only to a small extent, the difference being represented by imports.

The export of furniture and lighting fixtures is also very valuable, with a weight of 15% in total exports. Considering the high value (37.6 million lei), the main companies that can make such an export are Masifpanel S.R.L. (it exports wood panels, sawdust pellets, pallets) with a turnover of 44.3 million lei and Konkord Trans SRL (solid wood furniture) with a turnover of 7.7 million lei.

Agricultural products are present in two categories, with vegetables, plants, roots and tubers worth 27 million lei and processed vegetables and fruit, worth 4 million lei. Greenadel Prod SRL has a significant contribution, and its object of activity is growing vegetables and melons, roots and tubers.

There are no automobile factories in Gorj County, so the export of automobiles, tractors, and other land vehicles worth almost 20 million lei is mainly based on trading Dacia automobiles. Lazăr Service Com SRL is the largest dealer of Dacia and Renault vehicles in the county, with a turnover of 20 million lei in 2019.

## 4.5 The educational profile of the vocational schools in the county



This section presents an analysis of educational profiles, areas of training and the number of students in technological high schools and vocational schools in Gorj.

This indicates a solid basis for the availability of human resources for the development of new value chains. We can notice the emphasis on the technical profile, with a total number of 3,117 during the school year 2020-2021, of which 1,470 students are trained in mechanics, 544 in automation and electronics, 475 in electromechanics and 436 in electrical engineering, as well as 142 in construction and installations plus 26 in industrial chemistry. They cover a wide range of basic technical fields and match the value chains identified in the next chapter. At the same time, any production facility within these value chains will be able to use skilled labour in those sectors. In addition, there are 669 graduates in economics, who can also cover the potential demand for labour during the transition of the county's economy.

One of the major competitive advantages of Gorj County in attracting value chains is represented precisely by the human resources employed in the industry that is undergoing the transformation process towards climate neutrality. Besides technicians with mechanical or electrical specialisation, whose skills can be easily transferred to the value chains of clean technologies, in Gorj County there are a large number of power engineers, electrical and mechanical engineers who can use their theoretical and practical knowledge and skills in production, installation or operation and maintenance activities. They should be encouraged to become entrepreneurs and establish SMEs in the field of installation and maintenance of photovoltaic installations.

**Table 21**

Number of students in technological high schools and vocational schools in Gorj County in the 2020-2021 school year

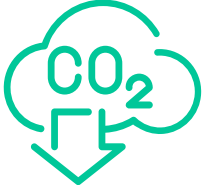
Source: Ministry of Education

Educational profile	Field of specialisation	Number of students		
		High school	Vocational school	Total
Natural resources and environmental protection	Environmental protection	373		373
	Food industry	228	14	242
	Agriculture	32		32
Services	Tourism and food & beverage	591	286	877
	Economics	669		669
	Trade	87	56	143
	The aesthetics and hygiene of the human body		64	64
Technical	Mechanics	474	996	1,470
	Electronics and automation	544		544
	Electromechanics	372	103	475
	Electrical	272	164	436
	Construction, building installations and public works	117	25	142
	Industrial chemistry	26		26
	Textile and leather industry	24		24

**5. Attracting value chains for advanced technologies and proposals for funding models for transition in the county**







The long-term decarbonisation of the economy in the EU will rely largely on the development of new technologies and advanced materials with low carbon emissions. The development of value chains for these technologies is under way in terms both of research and production, assembly and recycling. To ensure long-term economic development, local and regional authorities need to develop strategies to attract segments of the value chains for advanced technologies that should capitalise on the advantages of Gorj County in attracting European funding sources.

This report identifies four value chains on which a county development strategy should focus:

1. renewable energy and electricity grids;
2. energy efficiency in buildings and heat pumps;
3. batteries, components and infrastructure for electric vehicles;
4. “green” hydrogen-based technologies.

The county’s competitive advantage is represented by the existence of a well-developed electricity transmission infrastructure, by the access to funding tools and state aid, as well as by the human resources. As explained in the previous chapter, the county benefits from a technical educational profile in high schools and vocational schools. Courses attended by students trained in the fields of mechanics, electronics, automation, electromechanics and electricity, as well as in construction and utilities installations can be adapted to the specific needs of value chains for the presented advanced technologies. In addition, the human resources currently employed in the energy production sector, in particular mechanical or electrical technicians and energy, electrical and mechanical engineers, may be retrained for other manufacturing, installation or operation and maintenance activities for new technologies.

The Gorj County’s authorities and the relevant industrial actors must also be aware of the competition with other counties for attracting and developing value chains. It is therefore necessary to identify and build competitive advantages for the county. A key element is that of increasing local and regional administrative capacities, as well as creating a favourable environment for investors. This chapter proposes a series of measures regarding state aid and fiscal facilities, as well as some funding suggestions for attracting value chains for advanced technologies in the county.

## 5.1 Value chains contributing to the energy transition

For the counties where coal mining and its use in the energy sector represented the main object of activity, it is important to ensure continued relevance in the operation of the national energy system. By developing the proposed value chains, their role will remain important in the future.

Thus, the Gorj County authorities must encourage investments in value chains pertaining to economic sectors that have a future acknowledged and supported by European and global policies, strongly based on sustainability and digitalisation. This chapter only identifies those potential value chains that can have a lifespan of at least one generation (20-30 years), to ensure a social and economic transformational effect for Gorj County.

**A Strategic Forum report for the European<sup>19</sup> Commission identifies six strategic value chains at European level for a sustainable, inclusive, and competitive transformation of the European economy by 2030, three of which are directly linked to decarbonisation objectives:**











- 1. Clean, connected and autonomous vehicles;**
- 2. Low CO<sub>2</sub> emissions industry;**
- 3. Hydrogen technologies and systems.**

With the European Green Deal becoming the European Union's new economic growth strategy, the Commission opened debates on A New Industrial Strategy for Europe<sup>20</sup>, noting that the dual green and digital transition will affect all segments of our economy, society, and industry. These interdependent transitions will require new technologies, as well as investment and innovation, creating new products, services, markets, and business models. They will shape new types of jobs, which require skills that we do not have yet, while also promoting the transition from linear production to a circular economy.

19. Strategic Forum for Important Projects of Common Interest (2019)

20. The European Commission (2020)

According to a McKinsey study<sup>21</sup>, the technologies with the greatest contribution to achieving climate neutrality, in the cost optimal scenario, are:

	<b>Onshore wind energy;</b>
	<b>Photovoltaic energy;</b>
	<b>Electric vehicles;</b>
	<b>Heat pumps;</b>
	<b>Heavy-duty electric transport;</b>
	<b>Offshore wind energy;</b>
	<b>Use of hydrogen in steel production (DRI – EAF H2);</b>
	<b>Carbon capture and storage (CCS);</b>
	<b>Fuel cells used in heavy-duty transport;</b>
	<b>Biofuels for aviation and maritime transport.</b>

Some of them were also identified by the National Bank of Romania (NBR) in Analiza Grupului de lucru CNSM pentru sprijinirea finanțării verzi (Analysis of the CNSM Working Group to support green finance).<sup>22</sup> The document identifies as green areas those where new industrial value chains can be attracted for relocation or development at national level: clean energy and its applications, electric vehicles, energy efficiency and digitalisation of green sectors. The report also proposes three recommendations to support the structural change of the economy towards one with a higher added value, which may be of interest for the transformation of Gorj County:

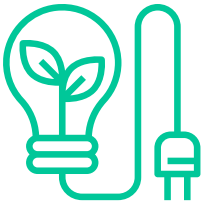
1. **Recommendation to the Ministry of Economy, Entrepreneurship and Tourism, due by December 31, 2021:** developing an industrial policy focused on the climate change agenda, with annual phasing until 2025, in line with the European Commission's New Industrial Strategy for Europe, where two areas are highlighted: green transition and digitisation. The industrial policy must also include solutions for relocating and developing in Romania some global production chains related to sustainable technologies.
2. **Recommendation to the Ministry of Finance, the Ministry of Economy, Entrepreneurship and Tourism, the Ministry of Energy and other ministries or government entities, due by December 31, 2021:** granting additional score, in any support scheme offered by the authorities (state aid, guarantees from the loan guarantee funds, finance from European funds, stimulating investment, exports, etc.) to companies that contribute significantly to the achievement of the climate change agenda.
3. **Recommendation to the Ministry of Finance, the Ministry of Economy, Entrepreneurship and Tourism and the Ministry of Foreign Affairs, due by December 31, 2021:** developing and publishing a methodology to identify companies with domestic capital that competitively produce goods and services related to the green sectors. Creating, periodically updating and publishing a list of these identified companies using the specified methodology. Involvement of Romania's diplomatic and commercial representatives abroad in promoting the companies mentioned on this list.

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**Based on this information and taking into account the context of Gorj County, as well as the national one, we propose the following value chains with prospects to be developed locally and to ensure a successful social and economic transformation in the energy transition:**

- **Renewable energy and electricity grids;**
  - **Energy efficiency in buildings (and heat pumps);**
  - **Batteries, components and infrastructure for electric vehicles;**
  - **Clean hydrogen-based technologies.**
-

## 5.1.1 Renewable energy and electricity grids



According to the Integrated National Energy and Climate Change Plan 2021-2030 (NECP),<sup>23</sup> Romania has committed to a target of 30.7% with regards to renewable energy, which translates into around 7 GW of new renewable capacities (wind and photovoltaic) that will enter the energy system by 2030. In addition, a large part of the 4.5 GW of renewable wind and photovoltaic capacities already installed will have to undergo a process of lifetime extension or even replacement by the end of the decade.

Thus, **a market of over 10 GW will be created in Romania alone,** although neighbouring markets can also be considered, especially if Romania manages to position itself as a regional leader in the field. It should also be noted that this capacity will increase following transposition into national plans of the new GHG emission reduction targets of at least 55% by 2030, a process that will take place in 2023. Thus, given the pressure of lower technology costs on labour costs in Western Europe, but especially on the ability of renewable industry producers to cope with the growing demand for new capacity, this creates strong premises for attracting and developing a segment of the component manufacturing industry at national level.

According to the studies and calculations presented in the previous chapter, **Gorj County has significant potential for producing renewable energy, but attracting a part of the renewable energy value chain is based on covering the needs of the national market and even of the regional one.**

So far, in the Oltenia area, renewable capacities of approximately 200 MW have been installed, mainly photovoltaic, but also 2 MW in wind energy.<sup>24</sup> The new wave of investment brings about plans to increase the installed capacity. The “OEC restructuring plan for 2021-2025 and prospects for 2030”<sup>25</sup> provides for the construction of eight PV parks with a total capacity of 725 MW on the slag and ash dumps, respectively on the existing tailings in Gorj County, which will become operational starting with 2023. In addition, given the sharp decrease of renewable energy costs, further investments in this field are expected in the coming years in the region.

**Gorj County has several special competitive advantages for developing the renewable sources value chain at local level, including the following two:**

- **It has a well-developed electricity transmission infrastructure, with significant capacity to connect and take over the energy produced from renewable sources. Transelectrica representatives have recently stated that around 1,000 MW of renewable energy can be connected in the South-West region, which would not require the strengthening the network, depending on what happens to OEC’s capabilities.<sup>26</sup>**
- **A pool of highly qualified specialists (engineers, sub-engineers, technicians) in the energy field, who can use their technical knowledge and experience in the field of renewable sources.**

23. The Integrated National Energy and Climate Change Plan (2020)

24. RWEA (2021)

25. Planul de Restructurare al Complexului Energetic Oltenia cu 2021-2025 cu perspectiva 2030 (2020)

26. Newsenergy (2021)

The renewable industry in Romania, through the associations RWEA and RPIA, carries out two programs with potential impact on the involvement of economic actors and the workforce in Gorj County in the renewable industry:

- **The Academy for Renewable Sources and Energy Distribution (RenewAcad)** - a professional training and reconversion project for people in coal-dependent regions, aiming to reskill and retrain up to 500 people in the field of renewable energy and energy distribution. According to Renew Acad, the technical and professional skills of mining technicians can be easily transferred to the sectors of renewable energy and energy distribution, and the certifications obtained following the training and retraining courses will allow them to find employment in the installation, operation and maintenance of RES projects and energy distribution networks around the world, with attractive salary packages.
- **RESInvest** - a program focused on localizing the renewable energy value chain in Romania, by encouraging the local production of technology for the renewable energy sector and by creating investment opportunities. The renewable industry considers that important sectors can be attracted and relocated in Romania, such as the production of equipment for renewable energy installations, including the training of skilled staff for their operation and maintenance. Romania can become a know-how hub by developing a local value chain for renewable energy, based on national research and innovation plans, as well as on related technological concepts such as storage, hydrogen, transport, and digitization.

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**Increasing the share of renewable energy will not be possible without considerable investment in strengthening electricity networks, both in terms of transport and distribution; this is yet another field where jobs can be created for the people in Gorj County.**

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The IEA<sup>27</sup> estimates the number of jobs created in production and development for every million euro spent along the renewable energy value chain:

- **Photovoltaic energy – 15**
- **Wind energy – 2.1**
- **New networks – 6.71**
- **Existing networks – 8.78.**

## 5.1.2 Energy efficiency in buildings and heat pumps



The investments in the renovation of buildings planned through NECP and SRTL create, in addition to jobs, demand for new materials and technologies. Premises are thus created for the development of the industrial chain in the field of intelligent and sustainable construction materials, including insulation systems, but also for the creation of a new value chain for efficient heating and cooling technologies (heat pumps).

In 2019, there were over 2,000 people working in the residential building in Gorj - most of them in companies with the “Construction of residential and non-residential buildings” NACE code, and the rest of them in companies performing related works.

**Table 22**

Turnover and number of employees in the construction of buildings and related works

Source: The National Trade Register Office (NTRO)

NACE Code	NACE Code name	Turnover	No of employees
4120	Construction of residential and non-residential buildings	226,596,006	1,502
4321	Electrical installation	78,807,045	256
4322	Plumbing, heat and air-conditioning installation	25,259,679	155
4332	Joinery installation	23,386,060	127
4333	Floor and wall covering	5,370,769	39
4329	Other construction installation	3,295,842	22
4334	Painting and glazing	5,539,149	57
4391	Roofing activities	1,636,579	4
4331	Plastering	831,252	4
4311	Demolition	89,945	4
<b>Total</b>		<b>370,812,326</b>	<b>2,170</b>

Another 714 people were employed in civil engineering works or in special constructions: construction of roads and motorways; construction of utility projects for electricity and telecommunications; site preparation; test drilling and boring, as well as other construction works.



Within the manufacturing industry, 1,503 employees work in fields upstream of building construction: manufacture of bricks, tiles and other construction products; wood cutting and planing; manufacture of other builders' carpentry and joinery; manufacture of metal structures and parts of structures; manufacture of doors and windows of metal; manufacture of flat glass; manufacture of builders' ware of plastic; manufacture of concrete products for construction purposes; manufacture of electric lighting equipment, etc.

Expanding this sector has a significant potential for the county, especially in view of the local economic profile, as shown in the previous chapter. According to the calculations in Chapter 2, the renovation of existing buildings in Gorj County alone, at an estimated cost of over 7 billion lei, could create, on average, employment for 1,030 people per year, if the investments are carried out for 25 years. The development of construction companies in Gorj can contribute to the renovation of buildings in the county and in the neighbouring ones; moreover, the development of the manufacturing industry can help increase the export of goods from the county.

Heat pumps can have considerable economic, environmental, and energy benefits, particularly given the climate neutrality goal over the next 30 years. Heat pumps are powered, preferably, by renewable energy and are the most efficient heating and cooling technology, especially when both services are needed in the same location and at the same time. Heat pump technology can provide major savings, as well as considerable environmental and social benefits for society. These benefits will continue to increase as the efficiency of the systems improves and heat pumps are used in more and more fields. These developments will bring about a decrease in the cost of production, in line with economies of scale and technological progress.

The heat pump industry is a major supplier of jobs in Europe. While the value chain of heat pumps is global at present, companies located in Europe are among the leaders, producing not only for the local market, but also for exports in the region.

According to the estimates of the European Heat Pump Association,<sup>28</sup> more than 54,000 full-time jobs are needed to manufacture, install, and maintain the annual sales of heat pumps in Europe, a conservative number if we consider that the latest data update took place in 2015, before the significant increase in the EU's climate ambitions. Given that not all employees work full time in the heat pump sector, the total number of people whose jobs are related to this technology is even higher.

In the long run, a rapid growth of the heat pump segment in the heat sector will not necessarily lead to a proportional increase in the number of employees, but will most likely lead to retraining the experts and technicians currently working in other product areas. Of the total number of jobs along the heat pumps value chain, 36% are in production, 30% in installation, 18% in component manufacturing, and 16% in servicing and maintenance.

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Romania needs a national strategy to decarbonise its heating sector, currently dominated by fossil fuels, and, respectively, by the inefficient consumption of firewood in rural areas. Certainly, for single-family dwellings, the installation of heat pumps is highly advisable. Such a strategy, aligned with the European Green Deal, will be an unequivocal signal for the development of this technology.

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### 5.1.3 Batteries, components and infrastructure for electric vehicles



Batteries are an important element of the European Green Deal, as they are a key technology in decarbonising road transport and making energy systems more flexible by installing utility-scale storage capacities.

The automotive sector is one of the strongest sectors of the Romanian economy and, at the same time, one of the most exposed to the transition to electrification. The subassembly manufacturers present in Romania are forced to adapt their production and business models for electric car models. A large part of the automotive sector components manufactured in Romania are still for models with internal combustion engines. At present, the two large car makers present in Romania do not produce any electric models locally. However, considering the clear market trend towards electric vehicles, the upcoming years will be marked by a structural transformation of the sector in Romania as well; Gorj County can take advantage of this opportunity with a view to attracting investments.

The immediate challenge of investing in battery production capacities in a competitive and sustainable manner is considerable, and Europe needs to position itself quickly in this global race. Starting with 2025, Europe could capture a battery market of up to EUR 250 billion per year, served by at least 10-20 *Gigafactories* (large battery factories) to meet the EU demand. Given the scale and speed of the investment required, this strategic challenge cannot be addressed in a fragmented manner. The Commission promotes a cross-border integrated European approach, spanning the entire value chain of batteries and focusing on sustainability, from raw materials extraction and processing to cell and battery pack design, manufacture and use, second use (*second life*), recycling and disposal in a circular economy system.

**Figure 14**  
Battery production stages

Source: CEPS (2020)



The battery value chain can be divided into the following segments:

1. extracting and processing raw materials;
2. cell component manufacturing;
3. cell manufacturing;
4. battery pack assembling;
5. electrical vehicle manufacturing and storage capacities building;
6. recycling and reusing;

**Gorj County could attract, at first, the battery assembly, respectively recycling and re-use, as well as the one related to extracting and processing raw materials, in the case of Baia de Fier graphite deposit exploitation.**

Over the medium term, building a Gigafactory in Gorj could be considered; it could also include cell production and battery assembly, depending on the development policies of the two car makers in the region, Dacia and Ford, and on the number of electric models to be produced locally. The first announcement in this regard was made by Ford; they announced that the Craiova plant will start producing an electric model in 2024.

Although the location of such factories can be established in elsewhere in the country, **Gorj County** has the opportunity to attract part of the value chain in the field of batteries, components and infrastructure for electric vehicles, building on the following **competitive advantages**:

- A significant share of companies in the manufacturing industry and of companies carrying out professional, scientific and technical activities, in terms of turnover, number of employees and number of companies in the county;
- The potential exploitation of the graphite deposit in Baia de Fier;
- The profile of the vocational schools in the county, with a large number of graduates in the fields of mechanics, electronics and automation, electromechanics, electricity, environmental protection;
- Possible flexibility with regard to state aid rules in areas affected by the energy transition<sup>29</sup>;
- The fact that it neighbours Vâlcea County, which has an advanced research infrastructure in the field of lithium-ion batteries at ICSI Râmnicu Vâlcea, and has attracted research projects on this topic, including Horizon Europe<sup>30</sup>.
- The fact that the county is close to automotive manufacturing centres of Romania;
- A Romanian company that has already implemented projects in the field of charging stations for electric vehicles, but also for the second-life use of batteries, is also present in Gorj County<sup>31</sup>.

29. European Committee of Regions (2020)

30. Hybrid power-energy electrodes for next generation lithium-ion batteries (2020)

31. Ziarul financiar (2021)

In order to take part in the European battery market and attract investments in this field, the Gorj County authorities should be involved in existing national and European cooperation platforms and expertise networks. In October 2017, the Commission launched the *European Battery Alliance* cooperation platform, which brings together industry stakeholders, interested EU Member States and the European Investment Bank. The participation of the county authorities in this European alliance is important for adopting good practices in the battery industry, building on the experience of other Central and Eastern European countries that have already succeeded in attracting at least one Li-ion battery manufacturer.

The charging stations value chain is closely related to the batteries and, respectively, electric vehicles value chains. The number of charging stations will increase significantly in the coming years at European and national level, and Gorj County could host a manufacturer, given the existing skilled workforce in the electrical and electrotechnical fields.

IEA<sup>32</sup> estimates the number of production and development jobs created for very million euro spent along this value chain as follows: batteries – 7.93; electric vehicles – 7.81.

## 5.1.4 Clean hydrogen-based technologies



Hydrogen can be used as feedstock, energy vector or fuel and has many applications that can help reduce greenhouse gas emissions in industry, transport, energy and the building sector. The EU Hydrogen Strategy supports the development of clean hydrogen production in Europe; from a European Commission perspective, the *Next Generation EU* economic recovery plan places hydrogen among the investment priorities as it can foster growth and resilience, help create jobs and strengthen the European Union's technological leadership.

According to the Strategy document citing data from IRENA, FCH-JU and BNEF, the share of hydrogen in the European energy mix will increase from less than 2% today to around 13-14% in 2050, generating investments between 180 and 470 million euro.

Between 2020 and 2024, over 6 GW of renewable hydrogen electrolysis production capacity will be installed, with a production of up to 1 million tonnes (mt), which is a significant opportunity for the development of this industry at national level.

32. Sustainable Recovery, IEA (2020)

Between 2025 and 2030, the installed electrolysis capacities will be at least 40 GW, which corresponds to a production of up to 10 mt renewable hydrogen, which will gradually become cost-competitive. Also, electrolyzers will be used to balance energy systems and to increase their flexibility. After 2030, renewable hydrogen-based technologies will reach maturity and be widely developed to help hard-to-decarbonise sectors.

Romania can attract a considerable part of investments at EU level by 2030, which will total between 24 and 42 billion euro for electrolyzers and between 220 and 340 billion euro for energy production capacities to ensure the supply of electrolyzers with renewable energy. Investments in hydrogen transportation, distribution and storage in the EU will total 65 billion euro by 2030.

**Gorj County has the potential to attract a part of the hydrogen value chain, especially in the construction of electrolyzers and elements of the transport, distribution, and storage infrastructure, based on the following competitive advantages:**

- A significant share of companies in the manufacturing industry and of companies carrying out professional, scientific and technical activities, in terms of turnover, number of employees and number of companies;
- The profile of the vocational schools in the county, with a large number of students in the fields of mechanics, electronics and automation, electromechanics, electricity, environmental protection;
- Possible flexibility with regard to state aid rules in areas affected by the energy transition<sup>33</sup>;
- The fact that it neighbours Vâlcea County, which hosts the National Center for Hydrogen and Fuel Cells within ICSI Râmnicu Vâlcea, with significant activities in the development and implementation of electrolyzers and PEM fuel cells;
- The central government's plans to develop gas-fired power plants to replace the coal-fired capacity of OEC and the possibility that they may also use hydrogen produced from renewable energy. Moreover, the plans for a gas and hydrogen power plant in a neighbouring county, Mehedinți, as well as the plans for the development of the gas and hydrogen mixture distribution infrastructure in the Oltenia region (NRRP).

For electrolyzers manufacturing, the authorities should aim to attract producers of PEM (Proton Exchange Membrane) electrolyzers. Compared to the alkaline ones, they are more efficient and more flexible, being more suitable for an energy system with a large share of variable energy sources. Another aspect to consider is the fierce competition from Asian alkaline electrolyzers manufacturers; they offer much lower prices compared to European and North American manufacturers.

As shown in Figure 15 below,<sup>34</sup> systems of hydrogen production by PEM electrolysis are complex, with a large number of components. Their assembly and configuration requires advanced technical know-how, among others, in the mechanical, electrical, hydraulic and electrotechnical fields, which can be transferred to the available workforce in Gorj County.

**In order to capitalise on the opportunity to relocate part of the hydrogen value chain to Romania and, more specifically, to Gorj County, joining the European Clean Hydrogen Alliance must be a priority for the government, together with the project proposal for IPCEI on Hydrogen.**

The IEA estimates that the number of jobs created in production and development for every million euro spent along the hydrogen production value chain will be 7.2.

**Figure 15**

System of hydrogen production by PEM electrolysis

Source: Hybalance.eu



## 5.2 The increase of the maximum state aid intensity for areas affected by the energy transition



One of the most significant competitive advantages of Gorj County in attracting and developing value chains in fields contributing to the energy transition is related to the increase of the state aid intensity for companies that invest in the counties affected by the energy transition. In April 2021, the Commission adopted its revised Regional Aid Guidelines, which will enter into force on 1 January 2022, and set out how Member States can grant state aid to support the economic development of disadvantaged areas while ensuring that Member States are treated in an equitable manner.

The main objective of the regional aid is the economic development of disadvantaged EU areas. By facilitating the sustainable development of assisted areas, the aid contributes to the EU's territorial cohesion policy, which aims at improving economic and social cohesion by reducing development disparities between regions. The Commission Communication provides an increase of the maximum State aid intensities to support the objectives of the European Green Deal and the EU Digital Strategy by providing additional incentives for investments in just transition areas.

Most of Romania's territory, including Gorj County, is on the approved map of regional state aids<sup>35</sup>, identified as an assisted region ("a"), specifying the maximum intensities of state aids that can be granted in those areas. Indeed, according to the most recently published map of regional state aids in 2016, all NUTS 2 regions in Romania, except the Bucharest-Ilfov region (classified as a "c" area) are designated "a" areas.<sup>36</sup>

According to section 7.4.1 of the Guidelines on Regional State Aid, they are as follows:

- 50% in NUTS 2 regions whose GDP per capita is below or equal to 55% of the EU-27 average;
- 40% in NUTS 2 regions whose GDP per capita is above 55% and below or equal to 65% of the EU-27 average;
- 30% in NUTS 2 regions with a GDP per capita above 65% of the EU-27 average.

Added to these values are increases in the maximum allowable state aid intensity for SMEs (7.4.3):

*"The aid intensities laid down in [subsection 7.4.1] may be increased by up to 20 percentage points for small enterprises or by up to 10 percentage points for medium-sized enterprises."*

In addition, subsection 7.4.4 is relevant for Gorj County, and for other regions designated as territories identified for support from the Just Transition Fund (JTF):

*"The maximum aid intensities laid down in subsection 7.4.1 may be increased by 10 percentage points for territories identified for support from the JTF in a territorial just transition plan of a Member State approved by the Commission on the condition that those territories are located in assisted areas [...]"*

35. The Official Journal of the European Union (2016), Vol. 59, [25 June](#)

36. The European Commission ([2021](#))



**In conclusion, for a large enterprise, the maximum state aid intensity in Gorj County can reach 60% (50% according to the conditions of an “a” area and another 10% based on the territorial plan for just transition, through JTF), for a medium enterprise it can reach 70%, and for a small enterprise 80% – adding bonuses for SMEs according to section 7.4.3. Thus, the competitive advantages for investments in Gorj County based on state aid that can be granted cumulatively are particularly significant.**

Extremely large amounts can thus be allocated through national state aid schemes, approved by the Commission, for the regions included in the just transition plan, separately from the funding available in these regions through the Just Transition Fund and other European financial instruments.

Additionally, state aid may be granted for purposes other than social and economic development – for example, for research or environmental protection – based on state aid schemes governed by their own rules regarding intensity. In “a” areas, for example, depending on the specifics of the investments, several state aid schemes can be selected, and the one offering the most cumulated benefits will be chosen.

Finally, state aid that complies with the *General Block Exemption Regulation (GBER)*, according to Commission Regulation (EU) 651/2014<sup>37</sup> – and is under certain value thresholds (in the case of investment projects in renewable energy sources, under 15 million euros) are exempted from notification, and can therefore be implemented directly.

Besides, two more models of intervention can be planned to increase the advantages of Gorj County for developing of value chains. For example, *Smart Specialisation Strategies* are one of the most appropriate measures to support innovation in certain key sectors, which can be successfully applied in coal regions.<sup>38</sup> The fundamental principle is that of specialisation based on local specificity, instead of a more general approach that supports several sectors at the same time.<sup>39</sup> This development approach provides funding mainly for research and innovation, after prior identification of sectors having potential, which then become strategic priorities for creating regional and local policies. The regions thus select a limited number of priorities based on local competitive advantages, concentrating support activities and structural funds. This model implies the active involvement of all relevant stakeholders and is suitable for supporting the development of value chains. There are examples in Romania of such strategies developed in NUTS2 regions.

Another example is the concept of *Special Economic Zones*,<sup>40</sup> a regional instrument which is geographically delimited, for accelerating economic development in areas affected by economic stagnation. Focused primarily on post-industrial areas, they aim at attracting jobs and foreign investment by providing tax benefits, simplified planning procedures, and specialised business support services. In addition to these there are measures regarding the requirements for attracting human resources, which are related to improving the quality of life through high standards for housing, nurseries, schools, public transport, digital and medical services. Relevant examples for the application of this concept in coal areas include Katowice in Poland or Plovdiv in Bulgaria.<sup>41</sup>

37. Commission Regulation (EU) No. 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty.

38. European Policies Research Center (2019)

39. The European Commission (2017)

40. CEPS (2021)

41. Ibid.

## 5.3 Potential public sources of funding



In the context of the energy transition and post-Covid 19 economic recovery, Romania **has available numerous public sources of financing, both European and national, which can be accessed to develop new value chains and place Gorj County on the path to a green and sustainable economy.**

**The Just Transition Mechanism<sup>42</sup> stipulates three pillars through which affected areas can be helped:**

- The *Just Transition Fund* – Gorj County is one of the six counties that will benefit from total funding of about 1.95 billion euro based on the Territorial Just Transition Plans;
- a dedicated scheme within InvestEU for attracting private investments, in order to mobilise investments of approximately 10-15 billion euro, based on demand;
- a loan facility for the public sector, in which the European Investment Bank will mobilise additional investment for the regions concerned;

**In addition to these, the following are also announced for the period 2021-2027:**

- ROP Oltenia – with funding of approximately 1 billion euro;
- The Operational Programme “Sustainable Development” – with an allocation of 600 million euro for Priority 1 (Promoting energy efficiency, smart energy systems and networks and storage solutions and reducing greenhouse gas emissions);
- Operational Program “Smart Growth, Digitisation and Financial Instruments” – with funding of approximately 2 billion euro.

The Modernisation Fund, an instrument that, depending on the market value of ETS certificates, is likely to exceed 10 billion euro for Romania for the decade 2021-2030, as well as the Innovation Fund, a competitive instrument with funding of about 10 billion euro at European level, can also be important sources of investment to support Gorj County’s transition to a new economic model.

The Modernisation Fund, managed by the European Investment Bank, stipulates that 70% of the financial allocations will be made for so-called “priority projects”, which include projects for renewable energy, energy efficiency, batteries, high voltage grid development, etc., with a maximum of 30% to be addressed to “non-priority projects”, including those based on the use of fossil fuels. Furthermore, funding the latter cannot be determined before determining which priority projects will be granted 70% of the funding on a biannual investment cycle.

In the short term, the Recovery and Resilience Mechanism, through NRRP, offers Romania access to approximately 29 billion euro. One of the six pillars of the plan, the Green Transition, establishes a category dedicated to renewable energy and energy efficiency. Projects can benefit from funding if they are mature projects, provide advanced technical and economic documentation and can be completed by 2026. In addition, at least 37% of the total value of the funds must be directed to investments with a positive climate impact.

Still under negotiation with the European Commission, Romania's National Recovery and Resilience Plan proposes a support scheme worth 200 million euro for investments in renewable energy, in particular for SMEs, as well as for storage capacities. Another instrument within the plan assigns 167 million euro to research and innovation in the value chain related to batteries production and recycling. Last but not least, 10.5 million euro will also be provided for expanding the network of charging stations for electric vehicles.



# 6. Recommendations

- 1 Investments in renewable energy sources.** Gorj County has solar energy resources above the national average, and their exploitation should be a priority for the authorities, especially on state-owned land. Also, given the significant potential for the installation of PV roof panels, county authorities can develop a support scheme with European funding (e.g. through the Modernisation Fund), in addition to the national programme for supporting prosumers. As for the areas with potential for developing wind farms, they must be rigorously determined based on detailed *in situ* measurements.
- 2 Deep renovation of buildings** to increase energy efficiency. Such investments lead to major savings of primary energy consumption in buildings, as well as to the significant improvement of the quality of living conditions and to boosting economic activity at local and regional level. They will also have a significant contribution in terms of jobs and, through the positive effects on public health, they will contribute to reducing healthcare costs for the inhabitants of the county. Models of best practices from other EU Member States show that improving the quality of life (for which the quality of habitation represents an essential component) in transition regions is a key factor in regional social and economic development, especially in attracting and retaining human resources.
- 3** To ensure long-term economic development, local and regional authorities need to develop **plans to attract segments of the value chains for advanced technologies**, in parallel with national strategies. They will capitalise on the advantages of Gorj County in attracting European sources of funding, towards creating a favourable environment for investors and towards actively participating in European cooperation platforms, such as the European Battery Alliance and the European Hydrogen Alliance. We identify four value chains on which a county development strategy should focus:
  - Renewable energy and electricity grids;
  - Energy efficiency in buildings and heat pumps;
  - Batteries, components and infrastructure for electric vehicles;
  - Green hydrogen-based technologies.
- 4** In order to enhance the competitive advantage of Gorj County compared to other counties and regions, a range of **state aids and fiscal facilities** can be offered to industrial actors that can develop value chains locally. First, Gorj County authorities can benefit from the new *Regional Aid Guidelines* for increasing maximum state aid intensities in order to support the objectives of the European Green Deal and the EU Digital Strategy in transition areas. Similarly, they can implement models of facilities for investors, such as *Smart Specialisation Strategy* and *Special Economic Zone*.

- 5** Developing an **integrated plan for accessing European funding sources**. Considering the multiple financial tools that can contribute to funding the transition in the county, strategic planning is necessary regarding their use in a complementary manner. For example, investments in the energy sector can be covered by the Modernisation Fund, in particular by project proposals for the priority axis which includes renewable energy, energy efficiency, batteries, the development of the high voltage grid, etc. At the same time, the Just Transition Fund should focus on aspects related to economic and social transformation, prioritising investment with a direct impact on the people of Gorj County and their quality of life. Such a plan must also ensure the widest possible use of all available instruments, including those such as the dedicated Invest EU scheme to attract private investment in transition areas and the loan facility provided by the EIB as part of the Just Transition Mechanism.
- 6** **Increasing the administrative capacity**. This is needed to develop plans and strategies, to attract funding and prepare projects, to exchange experiences with other regions in transition, as well as to build a good relationship with the business environment. Strengthening the capacity of municipal and county authorities to access financial instruments for the sustainable transition, as well as funds under the Multiannual Financial Framework (MFF) for 2021-2027 is demonstrably a differentiator between regions with high economic development and those with low economic dynamics. In particular, the **modernisation of the bureaucratic system** is a priority in creating a competitive economic environment; best practices in this area are abundant, not only in Europe, but also nationally.
- 7** Another necessary condition for the transition of Gorj County is the **establishment of a concrete timetable for the phase-out of lignite from the national energy mix**. This is a key factor in economic planning at county level, which should put forward concrete and realistic solutions for a local post-lignite economy, with a view to controlling the unpredictable effects of this transition. The implementation of a plan to reduce the economic and social impact of the sustainable transition will lead to the long-term social and economic development of the county. It is therefore necessary for any development plan of Gorj County to be correlated with restructuring OEC.
- 8** **Local and county authorities must assimilate best practices from other European states** on maximising the opportunities offered within the EU for coal regions in transition. Recent experiences in Eastern Europe, such as Katowice (Poland), Prievidza (Slovakia), Mátra (Hungary), or Plovdiv (Bulgaria) show both the difficulty of the transition process and the major benefits that can be obtained. Active participation in platforms such as the *Coal and Carbon Intensive Regions in Transition Platform* is essential for acquiring this know-how.

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