

# Asturias, Spain

## GENERAL INFORMATION

**Country:** Spain

**Region Name:** Asturias

**Region NUTS2 code:** ES12 - Principality of Asturias

**Region NUTS3 code:** ES120 - Asturias

**Main urban centres in the region:**

Oviedo (population 220,020)

Gijón (population 271,843)

Avilés (population 78,715)

*\*NUTS: Nomenclature of Territorial Units for Statistics*

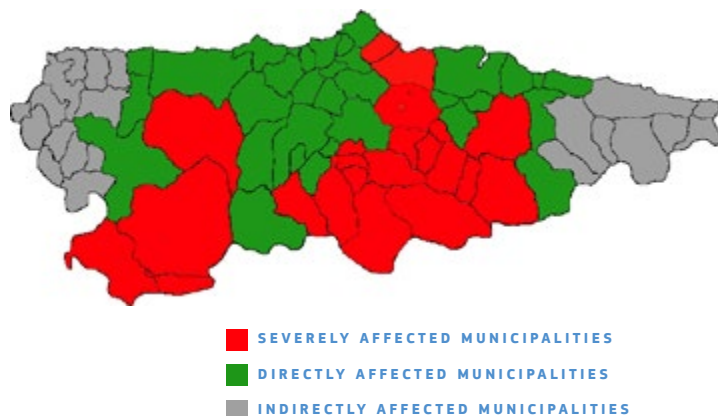


## NOTICE ON COVID-19

The data contained within this regional profile was primarily gathered prior to the COVID-19 pandemic. It is recognised that the pandemic has had an adverse impact on energy demand within the region. Although the consequences and implications are significant, they remain emergent and dynamic. An update to this document should be considered, once these consequences and implications are clearer and more quantifiable.

## Overview

Asturias is situated in north-west Spain and has a population of 1.02 million. The region's coal mining industry was concentrated in the south west and central areas of the region, where the region's coal power plants are also located. However, only one coal mine remains active. The region is composed of 78 municipalities, of which 57 are severely or directly affected by coal mine closures and the phase out of coal power plants. Most economic activity and a large part of the population are located in the central municipalities of Asturias.

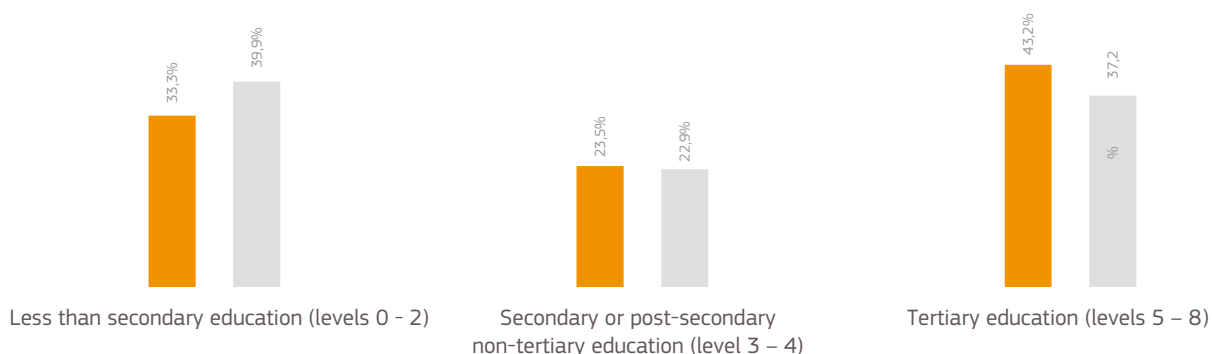


Source: Government of the Principality of Asturias, 2020

Regional socio-economic profile			
	Principality of Asturias (NUTS 2)	National (NUTS 0)	Date / Source
Population [persons]	1,027,624	46,658,447	2018 INE
Population density [persons/km <sup>2</sup> ]	96.6	92.7	2018 INE
Employment [No. persons employed]	390,600	19,136,300	2018Q4 INE
Employment rate [% share of population aged 20-64]	63.2 %	67 %	2018 INE
Unemployment rate [% share of labour force aged 15-74]	13.6 %	15.3 %	2018 INE
GDP per person [€]	€23,134	€25,100	2018 INE

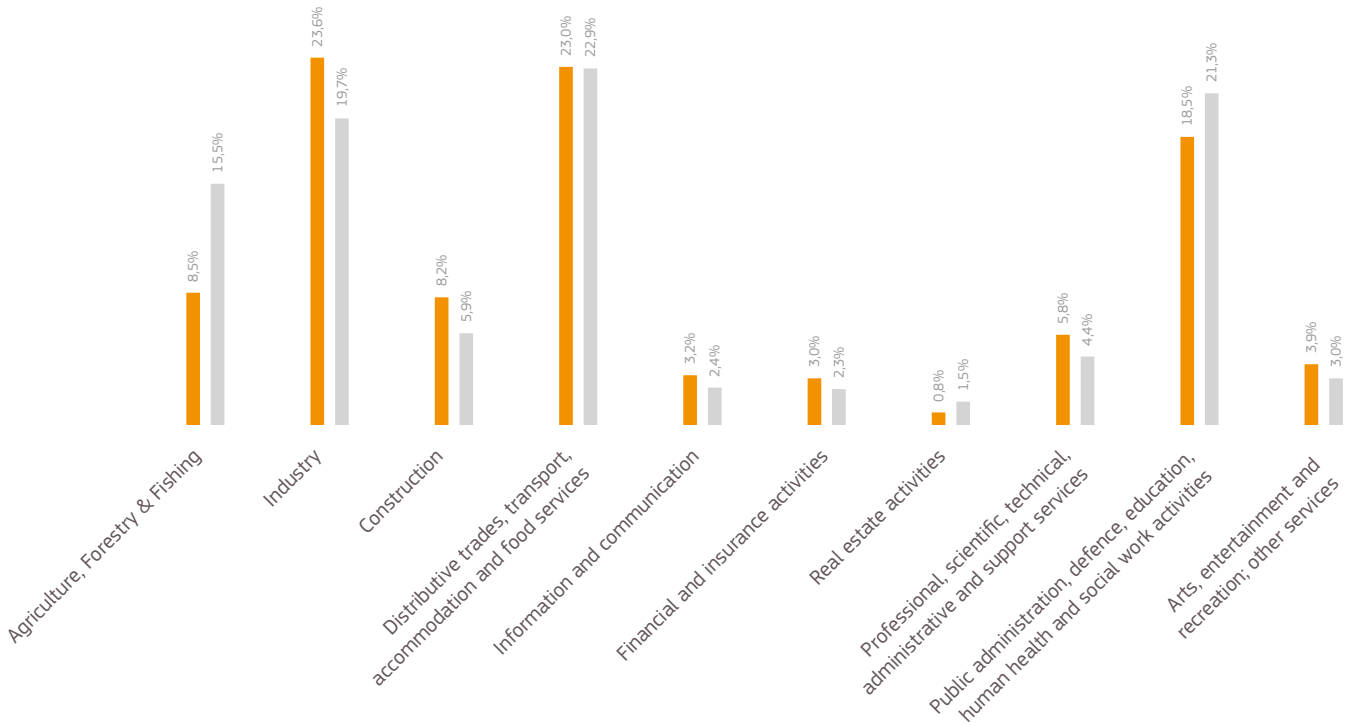
## Educational attainment

■ Principality of Asturias    ■ National Average



### Employment by sector

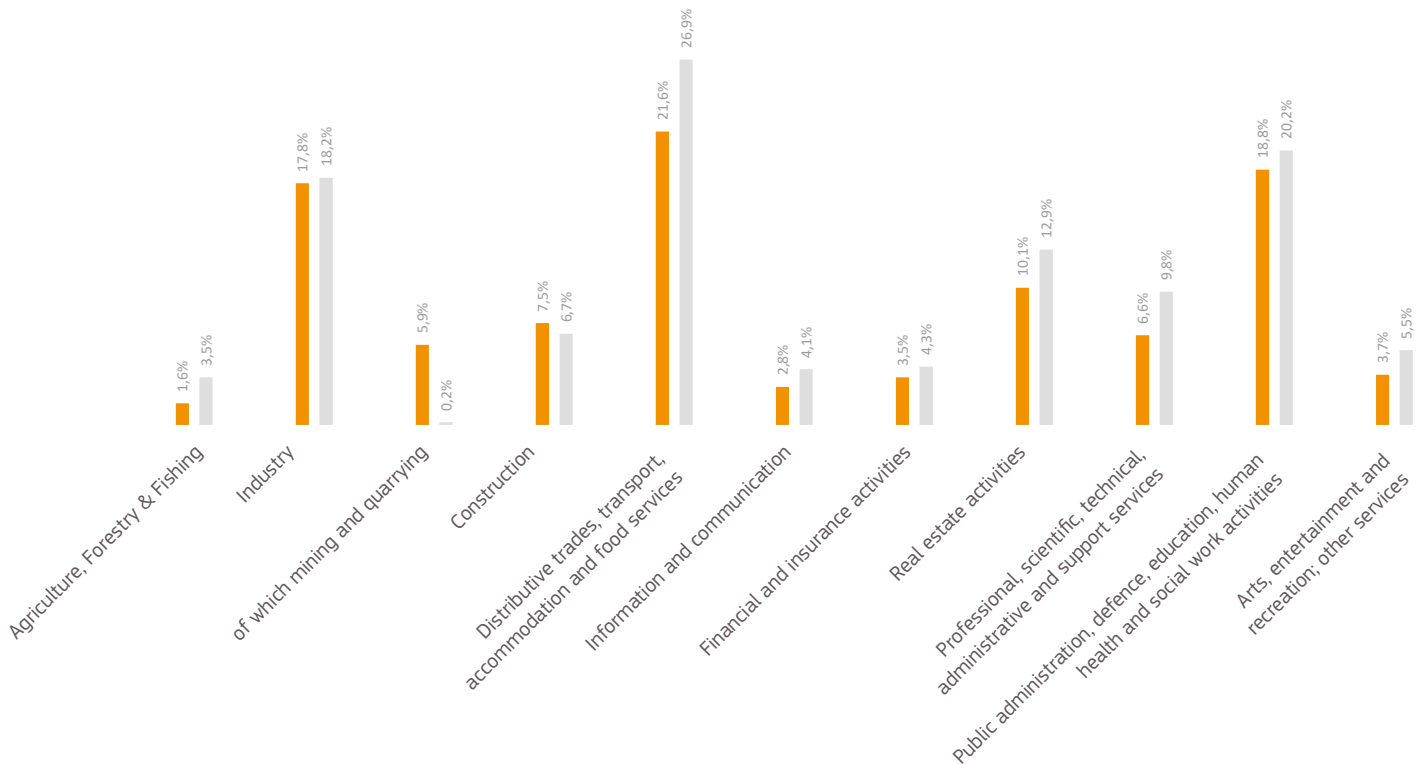
■ Principality of Asturias    ■ National Average



Data / Source: 2018 INE

### GVA per sector

■ Principality of Asturias    ■ National Average



Data / Source: 2018 INE

## General description of the demographic and economic profile of the region including notable trends and projections

Asturias has approximately 1.02 million inhabitants, representing 2.2% of the national population. The 57 municipalities affected by the coal mine closure and phase out process (see above) have a combined population of over 940 thousand, which represents more than 90% of the regional population.

According to a projection study by the National Statistical Office in 2014, the Spanish population is set to decrease in the coming 15 years by 2.2%, partly due to demographic ageing and a negative natural growth rate (i.e. birth rate falling below the mortality rate) as well as a negative migratory balance. Asturias is equally affected by population decline and ageing, and the situation is particularly acute in peripheral communities. Based on the projected trends, Asturias could register one of the greatest decreases in population in relative terms by 2029 in Spain (- 8.3%, preceded only by the region Castilla y Leon with -9%). In terms of an ageing population, the dependency ratio (i.e. ratio between the number of people aged 65 and over and the number aged 15–64) is projected to increase to 24.9% by 2029 and to 38.7% by 2064, from 18.2% in 2014.

Asturias has a relatively low employment rate of 63.2% (in 2018), compared to the national employment rate of 67.0% and the EU average rate of 73.2%. The unemployment rate in Asturias was 14.4% in 2019 (Q3), compared to the national rate of 13.9% which is among the highest unemployment rates in the European Union at 6.6% (2018). Asturias has also a high youth unemployment rate of 37.3% (of 15 – 24 year olds) in 2018, compared to the EU average of 15.2%, based on Eurostat. These trends are partly a consequence of different and continuous economic transitions.

Asturias has an important economic base of electro-intensive industrial processing activities (e.g. steel, zinc, aluminium, paper, glass, chemicals). Indigenous companies have a historically strong connection to the mining and energy sectors in Asturias and have an international orientation - some are also integrated in multinational companies, with decision makers located abroad. Asturias benefits also from a strong agri-food sector, notably in dairy products, meat and drinks. The sector has a high number of small-scale companies, often family-owned (approx. 1,700 according to the Principality of Asturias, 2020). Further important sectors include the forestry and wood products sector and tourism.

## Overview and general characteristics of coal-related industry

Asturias has two coal-mining basins, known as the Central Asturian and Western Asturian. Closure of coal mines in Asturias is almost complete, with six mines closed at the end of 2018 and only one remaining open (Pozo San Nicolás), which is scheduled to close in 2021. The 5 coal-fired power plants are located in the centre of the region, where 80% of the population and most economic activity are concentrated. Coal-fired power generation capacity is being phased-out rapidly. By 2021 there may only be 2 coal-fired generation units in operation or available for operation. These remaining units are to be closed by 2030, yet earlier closures are possible. Asturias is currently not positioned to replace its indigenous coal (and other fossil fuel) electricity generation capacity with renewable energy generation (e.g. wind and solar). This will mean that the region will switch from a net exporter to a net importer of electricity. Imports of electricity will rely on East-West transmission (e.g. from renewable sources from Galicia) and North-South connectivity, which is constrained due to difficult topography and constraints in the construction of transmission capacity through protected park areas. Significant investments are required to maintain security of electricity supply.

The decommissioning of regional coal power plants is significant not only from the perspective of electricity supply but also in terms of the service supplied by the grid – e.g. security and quality of supply – that are of importance for the region's industrial base, much of which is electro-intensive in nature and dependent on reliable and affordable electricity supplies. The phase out of coal and coal-fired electricity generation will also have significant implications along the whole value chain and for related supply chain and service activities. Notably, it will affect the port of Gijón, which is the largest port in Spain for solid bulk cargoes, including coal and ores, and related transport and logistics services, with an estimated 100,000 annual truck movements to transport coal from ports to power plants.

<b>Regional coal industry and coal power plants – recent historic profile</b>			
<b>Coal mining</b>			<b>Date</b>
Type of coal	Hard coal and		2019
Type of coal extraction	Underground anthracite		
Number of coal mines	11 coal mines were operational in 2017 (in 2020 only 1 mine remained – see text box below)		2017
Production of coal [Mt annual]	1.2Mt		
<b>Main coal mining enterprises</b>			
<b>Name</b>	<b>Ownership</b>	<b>Number of employees</b>	<b>Date</b>
HUNOSA (operator of remaining mine)	public	969	2017
CARBONAR	private	178	
COMPAÑÍA MINERA ASTUR-LEONESA	private	216	
MINERALES DEL BIERZO	private	105	
<b>Coal power plants</b>			
Number of coal power plants	5		2017
Installed capacity [MW]	2,222MW		
Share of coal in regional power generation mix [%]	75%		
<b>Main coal power plant operators</b>			
<b>Name</b>	<b>Ownership</b>	<b>Number of employees</b>	<b>Date</b>
EDP	private	366	2017
Iberdrola	private	144	
Naturgy	private	150	
HUNOSA	public	86	
<b>Regional employment in coal mining and coal power plants</b>			
<b>Employment</b>	<b>Number</b>	<b>Share of total regional employment [%]</b>	<b>Date</b>
Coal mining (direct employment)	1468	0.4%	2017
Coal power plants (direct employment)	746	0.2%	
Other coal-related activities [e.g. supply chain and services to coal operations]	1540	0.4%	

## Socio-economic characteristics of coal-related industry

In the 1950s, 100,000 people were employed in the coal industry in Asturias. Comparative high extraction costs have led to a gradual closure of mines in Spain, particularly in the Asturias region. By 2019, employment in the coal industry had fallen to 2,000. The planned closures of the remaining coalmine and thermal power plants in the coming years puts the remaining direct jobs at risk.

The extracted coal is supplied to coal-fired power generation in the region, with 75% of electricity generation in the region coming from coal (2017) compared to 17% for Spain as a whole (data for 2017). A significant quota of coal is imported. In relation with these uses, Asturias has an important coal supply and distribution chain, which moves about 9 million tons of coal by ship, truck and train every year. Of these 9 million tonnes, 3.8 million tonnes are consumed in the Asturian coal power stations; 2.7 million tonnes are needed for the Asturian steel industry, 2.3 million tonnes are consumed in the coal power stations of other regions and 0.2 million tonnes are exported.

Safe and stable coal-based electricity supply in Asturias has supported the development of an important electro-intensive industry, with the industrial sector having become the main regional economic activity. The cessation of the mining activity is thus expected to have a negative impact on the mainly electro-intensive industry with consequences for the related supply chain and service activities, notably port infrastructure, transport and logistics.

## Characteristics, trends and challenges of coal-related locations and communities

The population of Asturias is concentrated in the core (central) metropolitan area, formed by Gijón, Oviedo, Avilés, Siero, Langreo, Mieres. If these communities are treated as one conurbation, they would represent Spain's fifth largest urban area. The population is ageing with a slight decreasing trend, particularly acute in the peripheral communities, where the population density is low. These rural regions lack infrastructure, notably in ICT connectivity, the deployment of which is difficult due to the challenging topography. The downturn of economic activity and lack of employment opportunities has led to an emigration of young people to other regions of Spain.

Coal extraction is the most important generation technology and one of the major economic activities for the Asturias Region as a whole. The phase out of coal mining and coal related activities is expected to have a differential

impact across the region. Of the 57 mining municipalities directly or indirectly impacted by the cessation of coal mining, 21 municipalities are expected to be severely and directly impacted by the energy transition.

## Coal transition strategies, plans and projects

### Current status and timeline of coal transition

The decarbonisation of the Spanish economy is set within a framework of 3 national strategies (see section on current strategies). These strategies refer to a phase-out by 2030 in the electricity market and the closure of the least productive coal mines by 2019.

In the case of Asturias, most of the coal mines ceased to operate in December 2018 and the closure of thermal coal power stations, generating 5000GWh/year, is set for 2020. The other thermal coal power stations (967 MW, generating more than 6000 GWh) are set to close before 2030. There has been a reduction in the coal power plant activity due to an increased share of renewable technologies in the Spanish market. In addition, the COVID-19 pandemic and related economic downturn is having an immediate effect on energy demand which will probably continue in the longer term. Therefore, the context for transition is uncertain and rapidly changing.

The data of this regional profile was primarily gathered prior to the unfolding of the COVID-19 pandemic and its related consequences.

### Current strategies and plans for economic diversification / development and decarbonisation

At national level:

- Integrated National Energy and Climate Plan (PNIEC) 2021 – 2030: constitutes the draft integrated National Energy and Climate Plan (NECP) notified to European Commission in February 2019.
- Draft Bill on Climate Change and Energy Transition Law (Spanish acronym: LCCTE) – plan for decarbonisation of the Spanish economy by 2050.
- The Just Transition Strategy: foresees “just transition agreements” between government, unions and businesses in all regions affected by climate transitions; these agreements will support comprehensive strategies to offset negative impacts and finance green projects. Under the National Just Transition Strategy, the Just Transitions Agreement will consider three sub-regional geographical



groupings in Asturias: South-West, Centre (in two sub-groups) and Other affected areas. The national government will launch a social programme for unemployed workers (personalised pathways for workers affected by closures) that is targeted to 500 workers over 30 months.

Instruments:

- Economic support for development of coal mining councils (RD 675/2014)
- Economic support for labour costs to closure of coal mines (RD 676/2014)
- Urgent measures for just transition and sustainable development in coal mining councils (RDL 25/2018). Note: Although €600 million is available for urgent measures, €133 million concerns funding for earlier defined projects and there is a substantial allocation for social plans. Consequently, the available resources for new projects is around €150 million for whole country.
- Financing mechanisms will be fostered by the government to ensure retrofitting of the existing building stock and the construction of near-zero energy buildings. Subsidies will be given to low-income families to allow for retrofitting investments, based on energy savings audits and performance. Public-private partnerships will be established to reach retrofitting goals.

### Principal KPIs of strategies and plans

Spain envisages a 21% reduction in greenhouse gas (GHG) emissions compared to 1990. By 2030 Spain's economy has to reduce its GHG emissions by 21% compared with 1990 levels, and by 90% by 2050, with the remaining 10% being offset by Spain's carbon sinks.

The government aims for renewables to provide 42% of final energy consumption, achieved through a largely renewable based electricity system (76% of renewable energies). The objective shall be met through a steady stream of auctions adding 3,000 MW of new renewable capacity annually between 2019 and 2030, and 57,000MW of new renewable capacity to be installed. In terms of storage capacity, 3.5 GW of pumped storage and 2.5 GW of storage capacity in batteries shall be installed. Furthermore, new interconnections with Portugal (3,000 MW in 2030) and France (8,000 MW in 2030) are to be installed.

Finally, Spain aims for 39.6% energy efficiency improvement. This goal focuses on measures in both the transport sector and in the building sector, by banning the registration and sale of internal combustion engine (ICE) vehicles in 2040 and enforcing the installation of charging stations in petrol stations selling more than 5 million litres of fuel annually. Private and public buildings will benefit

from a retrofitting scheme, improving the thermal envelope of 1.2 million homes from 2021 to 2030, and promoting the use of renewable electricity sources. Lower carbon consumption patterns in consumers will be promoted through smart metering.

### Principal actors in development and implementation of transition strategies and plans

At national level:

- Ecological Ministry of Spain
- National Institute for Diversification and Energy Improvement.
- Institute for Just Transition

At regional level:

- Regional Minister for Industry, Employment and Economic Promotion
- Regional Vice-minister for Environment and Climate Change
- General Directorate of Energy, Mining and After-coal Development
- General Directorate of Climate Change
- General Director of Commerce, Entrepreneurs and Social Economy
- General Director of Natural Resources
- General Directorate of Industry
- General Directorate of European Issues
- General Directorate of Innovation and ITC
- General Directorate of training and employment
- General Director of Infrastructures
- General Director of Planning, Agricultural and Forest Resources
- Federation of Asturian Companies
- Asturian Economic development Agency (IDEPA)
- Asturian Energy Agency (FAEN)
- Asturian Federation of Town Halls and Municipalities
- Asturian Federation of Entrepreneurs
- Regional Trade Unions

Other notable actors and groups within the region:

- Multi-stakeholder Committee for the impact of Energy Transition in Asturias, launched in

October 2019, under the auspices of the National Government and aligned with the RIS3, Research and Innovation Strategies for Smart Specialisation and aligned with the social conciliation agreement (regional administration, employers, trade unions, and research centres), which serves to discuss and bring forward proposals for strategies on innovation and development in Asturias. The Committee's objective is to identify the impacts of energy transition on the energy sector and wider industrial base. The committee is organised into sector working groups (energy, primary, industry, services, environmental issues, each one led by a General Director with core competencies) and 5 technology working groups led by the General Director of Energy, Mining and After-coal Development (3 in operation: electrical mobility, gas mobility, industrial waste heat recovery; 2 to be constituted: biomass, energy storage).

- Administration Working Group for “Regional Strategy for Energy Transition and After-Coal Development”. The Working Group will co-ordinate and guide the development of a regional strategy, bringing together relevant regional administrative departments, and FAEN, to facilitate the development and formulation of an overarching energy transition strategy and the alignment of the Regional Administration’s strategies and policies linked to regional energy transition
- Regional Administration Working Group of Projects for Just Transition, to analyze, select and collect projects for Asturias, to establish preferable lines of development in Asturias.

At local level:

- Asturian Municipalities Federation
- Association of Coal Mining Mayors: engaged through periodic meetings with the Regional Administration to identify and approve projects to boost local economic activity and provide alternatives to mining.
- LEADER/CLLD: 11 Local Action Groups (LAGs)

### Role of civil society

Workers labour unions are taking part in the different working groups that have been established for the definition of the Regional energy transition strategy. Social dialogue across diverse public, private and civil actors is an important component of the transition process.

### Principal legislative drivers of transition

The national strategies above are developed in line with European legislation. Some key EU directives are:

- Directive 2018/844 on the Energy performance of Building
- Directive 2018/2002 on the Energy efficiency
- Directive 2018/2001 on the promotion of the energy from of renewable sources
- Directive 2018/1999 on the Governance of the Energy Union and Climate Action
- Directive 2019/944 on common rules for the internal market for electricity

At national level, the following legislative drivers apply:

- Strategic Framework for Energy and Climate, which includes 3 main documents:
  - National energy and climate plan (NECP, in Spanish PNIEC). Draft submitted to the European Commission
  - Draft Law on Climate Change and Energy Transition Law (Spanish acronym: LCCTE): under revision and discussion
  - Strategy for Just Transition

Current or expected transition challenges facing the region	High (priority) importance	Moderate importance	Minimal importance	Not important
Air quality	X			
Environmental degradation of land		X		
Demographic change (e.g. population ageing, outward migration)	X			
Narrow / concentrated industrial structure		X		
Modernisation of industry / re-industrialisation	X			
Employment creation	X			
Reskilling		X		
Transport infrastructure and mobility	X			
Social cohesion		X		
Limited partnerships and consensus		X		
<b>Other challenges</b>				
None specified				



## Transition challenges

### Nature and scale of transition challenges

The effect of the planned closures for the coming years of coal mines and thermal power plants will mean a reduction in economic activity in the region and a substantial loss in direct and indirect employment opportunities. In addition, the cessation of the activity of coal-fired power plants will mean that the regional energy sector will stop supplying safe and stable electricity to the electro-intensive industry.

The region is currently not well positioned to implement significant increases in its renewable energy generation in the short term. Thus, Asturias will switch from being a regional net exporter to a net importer of electricity. However, transmission lines from North-South are constrained due to topography and issues to constructing transmission capacities in protected areas

### Infrastructure weaknesses

Significant transmission grid capacity is available, but concerns relate to its medium and longer-term suitability given changing patterns of energy supply. Today, the following interconnections between Asturias and its neighbouring regions exist: two lines of 400 kV (Lada – Pola de Gordon and Soto Ribera – La Robla) with Leon (to the South), two lines of 400 kV (Pesoz – Boimente) with Galicia (to the West) and one of 400 kV (Soto Ribera – Penagos) with Cantabria (to the East). However, these electrical interconnections would be insufficient to ensure a stable electrical supply for the regional demand, once the power stations are closed. Furthermore, most of the industrial energy demand is supplied with the 220 kV grid (where part of the coal stations are connected); the interconnections between the grid of 400 kV and the grid of 220 kV is made through one electrical substation. When the coal power stations close, most of the electricity will be supplied by the 400 kV grid, so it will be necessary to improve the interconnections among the 220 kV and 400 kV grids. There is a need to guarantee the safety and quality of supply. The regional industry, with many continuous processes, is very sensitive to grid behaviour and to the quality of supply.

Despite a good availability of transport infrastructure (ports, logistics platforms, motorways and rail networks), some major constraints remain. There is a lack of high-speed train connections with other regions. A line currently under construction to interconnect to the south (Gijón – Madrid) is blocked due to topographical issues in the mountain range between Asturias and León. There are no current plans to improve interconnections to the east (with Cantabria) or west (to Galicia). The region also lacks regular shipping connections. No maritime lines (ferries, cruise lines or goods lines) between the Asturian ports and other

European ports currently exist. Finally, the only highway connecting Asturias with the south has a toll that makes freight transport by road less competitive.

### Weakness in other industries and economic activities

The closure of thermal power stations will affect the electro-intensive regional industry (especially the metal industry). A stable and secure supply of electricity is required, though the source of supply is yet to be identified. Should this lead to an unstable energy baseload, the region runs the risk of delocalisation of the electro-intensive regional industry. Furthermore, industrial activities relating to metal processing and fabrication, and manufacturing of equipment represent the most important industrial sectors of the regional economy and the supply of a competitively priced metal is a key feature of the competitiveness of these related industries.

The price of energy in Spain is another added challenge for the regional economy.

The predicted closure of coal power plants is a major issue. Two of them have to close in June 2020 due to European Legislation, CT Narcea and Aboño I; the prior has applied for closure whilst the latter is reconverting from coal to burning gas from steel processes. A third coal plant, CT Lada-Iberdrola, has applied for closure, although it complies with European Legislation.

The two other coal power plants in the region (Aboño II and Soto-3, both from EDP) had initially stated that they would remain opened until 2030, but they are now in danger due to market conditions.

## Transition opportunities

### Nature and scale of transition opportunities

Asturias has various transition opportunities, particularly in the reconversion of coal-related sites for the use of alternative energy sources and new economic and social activities (see below).

### Current partnerships, initiatives and investments supporting economic diversification / development and decarbonisation

Partnerships:

- To assess the impact of the decarbonisation process in Asturias, a regional Committee has been set up, which includes companies' associations and workers labour unions. It is a collaboration platform to

Transition opportunities where the region is already active or where there is interest to develop activities	High (priority) interest	Moderate interest	Minimal interest	Not interest
<b>Reconversion of coal-related sites / locations for renewable / alternate energy</b>				
Biomass	X			
Energy storage	X			
Gas		X		
Geothermal	X			
Hydro power and pumped hydro-storage	X			
Hydrogen	X			
Solar			X	
Wind	X			
<b>Other energy related opportunities</b>				
Reconversion of coal-related sites for new economic and social activities	X			
Repurposing of coal-related industrial infrastructure		X		
Heritage, culture and tourism		X		
Low carbon mobility and transport	X			
Diversification of coal-related supply chain and service activities			X	
<b>Other opportunities</b>				
Industrial waste heat recovery	X			

identify issues in the energy sector and extending to other affected sectors, as well as providing solutions in other industries and economic activities influenced by the closure of coalmines and thermal power stations.

- Besides this, three working groups based on public and private cooperation, composed by regional stakeholders (companies, research centres and regional administration) were established to identify, define and implement potential initiatives / projects. Each working group is focused on a specific area for diversification / decarbonisation, i.e. electric mobility, natural gas for mobility fuel and industrial waste heat recovery. Working groups will also be launched on biomass and energy storage (including Hydrogen).

Initiatives:

- Under the National Just Transition Strategy, the Just Transitions Agreement will consider three sub-regional geographical grouping in Asturias: South-West, Centre (in two sub-groups, Nalon and Caudal). The national government will launch a social programme for unemployed workers (personalised pathways for workers affected by closures) targeted

to 500 workers over 30 months. A public consultancy process was launched on the 27th of March 2020 by the National Government, with a 3-week period (after the COVID-19 state of alarm) for analysing the current situation and proposing ideas.

- HUNOSA, the main mining company in the region, is investing in different projects for diversification of its activity (energy supply, tourism, etc).

Investments:

- According to the National Government and Minister for Ecological Transition and Demographic Challenge, in the short-term some €600 million is available for urgent measures, which includes €133 million of funding for earlier defined projects and a substantial allocation for social plans. Consequently, the available resources for very urgent new projects is around €150 million for the whole country.
- The National Integrated Plan for Energy and Climate (PNIEC) quantifies a total of €236 billion of investment needs for the period between 2021 and 2030, of which 20% (approximately €47 billion) will come from public sources (i.e. investments by different administrations: national, regional, local

and European). This would mean approximately €4.7 billion of public funding per year. Accepting that local and regional financing capacities are much smaller than at the national level, this implies a funding commitment on higher level administrations.

### Notable research capabilities and facilities

Asturias has a network of research centres some of which have a distinct focus on the energy transition:

- INCAR: Institute of Science and Technology of Carbon (former Institute of Coal) development of materials based on carbon and clean technologies for use and conversion of coal, focusing on Capture and Storage of CO<sub>2</sub>, co-combustion of coal and biomass, energy storage. It belongs to the National Superior Council of Scientific Research (CSIC),
- Idonal: materials and advanced manufacturing, partnering in projects on materials and manufacturing methods of wind turbines and solar systems.
- CETEMAS: wood and biomass.
- CTIC: IT technologies.
- ASINCAR: food industry and taking part in research projects on biogas.
- University of Oviedo: working groups linked to the mining engineering schools, covering different fields of mining, materials and energy.
- INDUROT: Institute for Natural Resources and Land-Use Planning

### Notable labour force skills and knowledge

The regional labour force has a degree of specialisation in skills linked with the main regional activities. The energy sector has specialised machinery operators, electrical specialists, mechanical specialists, drill operators, mining and energy engineers, logistic coordinators, health and safety officers, or thermal power operators. There is an availability of specialised workers in the metallurgy sector, such as manufacturing of metal components, and for the chemistry and agro-food industry, namely specialised machinery operators, welders, fitters, industrial engineers. The notable forestry sector has also workers specially trained and skilled in related activities and tasks.

### Notable infrastructure

Asturias is an industrial region and, for this reason, has some notable infrastructure, including:

- Port of Gijón with the most important facilities of dry bulk cargo of Spain.
- Zalia, an industrial area available in the centre of the region designed for logistics and industrial activity for the Atlantic Area.

### Notable non-coal economic activities, industries and inward investments

Other than coal-related activities, the regional industry is concentrated around 6 different activities, making up more than 75% of the industrial activity:

1. Manufacturing of metals: steel, zinc and aluminium
2. Manufacturing of metal components
3. Chemistry
4. Non-metallic mineral products (cement, etc.)
5. Agro-food industry: meat, dairy group products
6. Paper mills

The latter two activities are present in the more peripheral, rural areas.

## Notable ongoing and recent coal transition / economic diversification projects

Notable projects related with the coal transition process are being developed in Asturias due to the closure of most of its coal mines. Some best practices are mentioned below:

### Project 1. Heat recovery from water of a closed-down mine for heating and cooling of urban areas

Heat recovery of mine water from a closed-down coal mine for the district cooling and heating system in the town of Mieres. The system is supplying a hospital, three buildings of the Campus of the University, a secondary school, two residential buildings and the headquarter of the Fundación Asturiana de la Energía.

- Thematic coverage: economic diversification and energy transition.
- Source of funding: ERDF funds and investment of HUNOSA
- Stakeholders involved: HUNOSA, Directorate-General of Energy and Mining of Asturias, Municipality of Mieres, University of Oviedo and FAEN
- Development stage of project: heating and cooling network in operation
- Source: [http://www.aulahunosa.es/geotermia-2/#\\_barredo\\_geotermia](http://www.aulahunosa.es/geotermia-2/#_barredo_geotermia)

## Project 2. Mining tourism package ("Minas de Asturias" brand)

Across mining facilities, museums and tourism centres have been developed to explain the history of coal mining in the region. There are three main facilities: "Museo de la Minera y de la Industria de Asturias", "Ecomuseo Minero Valle de Samuño" and "Pozo Soton".

- Thematic coverage: economic diversification and heritage and culture.
- Source of funding: Funds for developing of mining areas and investment of HUNOSA
- Stakeholders involved: HUNOSA, Directorate-General of Energy and Mining of Asturias, Municipality of San Martín del Rey Aurelio and Municipality of Langreo
- Development stage of project: in operation
- Source: <http://www.minasdeasturias.es>

Some of the over 60 planned projects include:

### "Energy storage with molten salts" project

- Description: taking advantage the facilities of a thermal coal power station closure for energy storage of electricity using a system of molten salts. The region has a clear need on energy storage.
- Thematic coverage: energy transition.
- Source of funding: public and private financing
- Stakeholders involved: TSK, EDP
- Development stage of project: depending on regulation

### "Repurposing of Aboño-I from coal to burning of gases from steel process" project

- Description: using dirty gas from steel processes to generate electricity to be consumed by Arcelor Mittal in their facilities. Good advantages in environmental aspects and also contributes to improve the competitiveness of the steel facilities.
- Thematic coverage: energy transition.
- Source of funding: public and private financing
- Stakeholders involved: EDP, Arcelor Mittal
- Development stage of project: project and agreement between companies signed, tramitting

### "Energy storage initiatives" project

- Description: taking advantage of regional technological capabilities and regional companies with international experience in the energy sector.

The region has a clear need on energy storage.

- Thematic coverage: energy transition.
- Source of funding: public and private financing
- Stakeholders involved: EDP, IMASA, etc.
- Development stage of project: design phase, depending on regulation

### "Energy storage by reversible water pumping and mine water sewage" projects

- Description: taking advantage of national technological capabilities and regional needs on energy storage, as well as analysing the need to treat mine water.
- Thematic coverage: energy transition.
- Source of funding: public and private financing
- Stakeholders involved: ERBI.
- Development stage of project: depending on regulation

### Hybridization of CT La Pereda

- Description: Adaptation of a thermal coal power station for using biomass and coal, and other types of waste
- Thematic coverage: energy transition.
- Source of funding: Not defined
- Stakeholders involved: HUNOSA, IMASA
- Development stage of project: design phase

### "Lanzaderas" project

- Description: Use of an electric bus for transporting students to the Campus of Gijón. The bus will be charged with electricity produced with renewable energies.
- Thematic coverage: mobility and energy transition.
- Source of funding: Not defined
- Stakeholders involved: University of Oviedo and Grupo Táctica.
- Development stage of project: design phase

### "Pilot initiative for changing truck fleet from diesel to GNV" project

- Description: The main road transport association of the region proposes to change part of its fleet from diesel to GNV.
- Thematic coverage: mobility and energy transition.

- Source of funding: public and private financing
- Stakeholders involved: CASINTRA
- Development stage of project: initial phase

#### **“Harness of industrial waste heat” project**

- Description: waste to heat system from a paper mill factory to a district heating system for an urban area (Navia).
- Thematic coverage: energy transition.
- Source of funding: public and private financing
- Stakeholders involved: ENCE, municipality of Navia
- Development stage of project: design phase

#### **“Biogas district heating system” project**

- Description: district heating of an industrial park (Tineo) with waste heat from a biogas plant.
- Thematic coverage: energy transition.
- Source of funding: public and private financing
- Stakeholders involved: BFC, municipality of Tineo
- Development stage of project: design phase

#### **“Biomass management initiative” project**

- Description: A pellet production plant to generate raw materials for other industries based on wood and biomass, providing a circular economy solution (Tineo).
- Thematic coverage: economic diversification, employment creation, energy transition.
- Source of funding: public and private financing
- Stakeholders involved: PELLETS ASTURIAS and GESTION DE BIOMASA FORESTAL
- Development stage of project: pre-investment phase

## Sources

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## Platform for coal regions in transition

The Platform for coal regions in transition is an initiative by the European Commission.

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