

# 1 Assessment and recommendations

## Assessment

### ***Andalusia is the largest mining producer in Spain and a growing mining player in Europe***

Andalusia, the southernmost region of Spain, has the largest population and second-largest land area in the country. It is the lead mining region in Spain in terms of production (38.6% of mining production) and employment (28.4%). Andalusia is also a growing player in the European mining sector, distinguishing itself as the second European producer of copper and leader in the production of marble and gypsum. The region's location in the Iberian Pyrite Belt (IPB), encompassing Seville and Huelva through to Southern Portugal, represents a global asset when it comes to metallic minerals. Within the region, Huelva is the main mining (TL3) region, producing 70% of the region's metallic mining<sup>1</sup>.

Andalusia hosts companies and activities at almost every stage of the mining value chain, from extractive to processing activities as well as technology and service providers. It benefits from two distinct mining subsectors, each with an extended supply chain. The metallic mining sector (copper, zinc and lead) accounts for most of the regional mining production and is largely made up of branches of large foreign-based companies. In contrast, the non-metallic sector (ornamental rocks, aggregates and industrial minerals) is highly dispersed across the territory and is composed of small local family businesses.

### ***Andalusia's mining ecosystem has the potential to make the region a frontrunner in environmentally sustainable mining while unlocking new business opportunities locally***

The EU's priorities, driven by the Green Deal and the new Industrial Strategy, have made sustained access to raw materials and the environmental sustainability of mining value chains a cornerstone of the EU climate neutrality goal for 2050. Raw materials are essential for the development of clean energy technologies (e.g. wind turbines, batteries, fuel cells and autonomous cars). The amount of minerals required for these technologies is greater than for fossil fuel-based counterparts and in some cases exceed the current production levels. The demand for both rare minerals (e.g. cobalt, lithium) and some traditional metallic minerals, such as copper, is expected to increase.

The increasing global demand and strategic EU support for sustained access to raw materials represents an opportunity for Andalusia. The mining ecosystem in Andalusia presents a number of strengths that can be further mobilised to become a frontrunner in resource circularity and environmentally sustainable mining. They include:

- ***Attractive geology.*** Andalusia's subsoil has diverse geology and, after many years of mining, remains highly prospective. It covers 60% of the IPB and holds the largest European reserve of non-ferrous minerals. Andalusia's mineral deposits contain some quantities of minerals identified as critical to supporting the generation of clean energy technologies (e.g. zinc, lead, silver, nickel,

cobalt, copper, molybdenum, manganese) and a rich mining endowment (more than 400 mines) that provides a fertile ground for technologies to recover traditional and critical minerals.

- *A strategic geographic location as the closest EU region to Africa and with cultural proximity to Latin America.* Africa and Latin America are important sources of minerals for Europe as well as relevant mining markets that also seek greater environmentally friendly mining practices. Responsible sourcing initiatives coupled with EU support for sustainable mining practices provide Andalusia with a competitive advantage to engage with African and Latin American mineral producers and become a gateway to and from the EU in sustainable mining processes and technologies.
- *Good infrastructure and proximity of mines to urban centres.* Andalusia's mining potential sits close to large urban centres, which provides the bonus of not having to operate in isolation, unlike many mining projects in other OECD regions. Logistics, health, safety and personnel matters are all greatly simplified by having urban centres closely at hand. The region also benefits from a reliable transport (roads, railroads and ports) and energy (sound mix of energy sources, with a share of renewables) infrastructure. Yet, work remains to be done to enhance the quality of the infrastructure (e.g. broadband) and the co-ordination among infrastructure plans and the mining strategy.
- *A marked mining identity with a young workforce that offers community support for mining ventures.* According to the 2018 INFACT survey (3 000 citizens), 60% of Spaniards showed an attitude between neutral and positive towards mineral exploration, which is relatively higher than in other European countries (Finland, Germany). Despite the impact on perception after the environmental disaster in the Aznalcóllar Mine at the end of the 1990s, Andalusian communities kept recognising the benefits of mining for the local economy and regional development.

### ***Yet Andalusia needs to address some challenges to unlock the potential of its mining ecosystem and reduce the income and employment gaps with the national average***

Andalusia's economy is large but underperforms against the income levels of the national and OECD mining regions average. While the region is the third-largest contributor to national gross domestic product (GDP) (13.3% in 2019), its GDP per capita and productivity level are the third lowest in Spain and far below the OECD TL2 benchmark. The financial crisis hit Andalusia's economy hard and the region has not been able to close the income and productivity gap with the national average to the levels prior to the 2008 crisis. A high share of low value-added and seasonal service activities in the economy (e.g. retail, some tourism-related activities and real estate) has driven such a structural gap.

Mining was one of the drivers of the regional recovery after the 2008 crisis and can be instrumental to support the economic recovery to the COVID-19 crisis and help reduce the income and employment gap at the national levels. Contrary to the trends in construction and tourism, the value of the production and the share of regional employment of metallic mining have grown steadily since 2010. During 2000-18, employment in metallic mining grew above the levels of agriculture and construction. The recovery from the COVID-19 crisis will involve aiming at greater resilience and economic diversification. Leveraging the assets of its mining ecosystem and the relevance of raw materials for the energy transition, Andalusia could create new business for firms and offer value-added jobs for the community.

To attain new development opportunities, Andalusia has to overcome various challenges that affect its mining business environment. These bottlenecks include:

- *Low innovation levels in the regional mining value chain.* Innovation in Andalusia is mostly driven by government spending and higher education institutions. Despite some innovative industrial companies, including mining companies such as Cobre las Cruces or Cosentino, the levels of patenting and research and development (R&D) expenditure from the private sector are below the European average. Low levels of innovation in the region and mining ecosystem reflect a lack of

effective channels for collaboration among different types of firms and with research institutions (e.g. among metallic and non-metallic subsectors).

- *Furthermore, the region's educational attainment* (32% of the workforce with tertiary education) *falls below the average of Spanish regions* (39%) and the OECD benchmark of mining regions (36%), with the mining province of Huelva (25%) scoring some of the lowest levels in Andalusia.
- *A large share of small- and medium-sized enterprises (SMEs) and entrepreneurs in low-value-added activities.* The large majority of nascent entrepreneurs in Andalusia declare that their ventures do not generate innovations of any kind, nor new products, services or innovative features. Despite the growth of Andalusian mining sector over recent years, the share of new regional business within the extractive industries is relatively low, with most of new business creation taking place in tourism and non-tradeable services (shops, restaurants).
- *A complex and unpredictable administrative process for mining at the regional level that relies on an outdated national regulation.* Despite Andalusia's efforts to reduce response times in the permitting process (an objective of the regional mining strategy 2014-20), the average approval time of permits still lacks predictability, with the unclear directive of maximum response times and lack of standardisation on approval times for both concession and research permits. Delays in Andalusia also seem related to the legal vulnerability of public officials in charge of mining-related decisions linked to environmental appeals and legal actions against mining ventures. Finally, mining legislation relies on an outdated national law (1973 – prior to the Spanish Constitution of 1978 and the accession to the EU) with a number of legal guidelines issued at different times and without a legal co-ordinating document.

### ***A national mining strategy could help better mobilise the potential of the Spanish mining sector to support sustainable development and EU climate goals in concerned regions***

Spain is one of the few EU countries (e.g. Finland, Portugal, Sweden) with mining resources that does not have a national strategy on mining or minerals. Mining policy in Spain is a combination of regional mining policies, where regions are responsible for mining policy design, mining permit delivery and mining policy implementation. The national government (specifically the Ministry for the Ecological Transition and the Demographic Challenge) has a general monitoring role, mainly in charge of overseeing mining security, waste mining and issues related to mining processes when a mine is located across two regions. Since 2020, the national government has aimed to reinforce policy co-ordination on mining by initiating a process to establish a road map for the sustainable management of raw materials.

Despite current efforts for national co-ordination, the lack of a national strategy on mining development leads to duplication of actions among regions and missed opportunities to spur synergies across regional mining ecosystems and among national policy strategies. The national government has scope to perform a more active co-ordinating role in relation to mining policy, through a clear strategic vision on the role of mining for regional development and a policy approach that fosters regional co-operation on mining investment and promotes policy complementarities among mining and other national sectoral plans to boost innovation, attract investment and increase well-being.

### ***Andalusia's updating process of its mining strategy is a unique opportunity to make the regional mining value chain a frontrunner in assisting the EU climate agenda and an engine of income and well-being***

Andalusia's new Mining Strategy 2021-27, which is currently under development, can be an opportunity to overcome some shortcomings of the previous strategy (2013-20). Areas for improvement include establishing a clear and long-term vision for mining activities in the region, aligning it to regional development goals and identifying concrete outcome objectives with a clear timeframe for action. The new

strategy should also enhance the engagement with municipal governments and communities, while developing national and international networks.

*Defining a clear vision of the role of mining for regional development, with concrete objectives and a sound monitoring framework*

Developing a common vision will help create consensus within the regional government and across different actors at the local level. This process needs to go beyond mining by integrating strategic goals from other economic sectors. To overcome the old strategy's shortcomings, which presented too broad objectives and a lack of timeframe, the new strategy needs to identify simple, well-targeted and concrete outcome objectives, accompanied with a timeframe of priority actions for the short, mid- and long terms. Furthermore, the new strategy should be paired with a dedicated monitoring framework with clear differentiated outcome and output indicators, including indicators to measure horizontal goals.

*Involving municipal governments and local communities in the mining strategy*

The region's new strategy can benefit from a greater involvement of local governments and communities to gain legitimacy and consolidate a common vision. Municipal governments are complementary to the strategy as they provide a local vision and support with resource management and policy implementation. While the regional government has already regular interaction with local governments, this co-ordination is not formally institutionalised. Ensuring a better and sustained intraregional collaboration needs a greater alignment of the mining strategy with the municipal development plans and the formalisation of a communication channel among levels of government.

Defining mechanisms to involve views of local actors (e.g. citizens, universities and interest groups) on the future of mining development and incorporating their feedback in the strategy can improve the quality of policy outcomes. Host communities tend to be on the front line regarding the negative externalities from mining ventures, while benefits span across national/regional governments and firms. The strategy needs to clearly define the institutional channels for community engagement in policy design and implementation and a clear framework on benefit-sharing agreements (monetary and non-monetary benefits) with local communities.

*Unlocking synergies with other policy strategies and sectors to boost innovation*

The strategy has a particular scope to improve linkages with other economic activities and, in particular, with the service activities associated with mining value chains. The new strategy needs to establish the institutional mechanisms to create links with other sectoral plans and with Andalusia's smart specialisation strategy (e.g. aerospace, renewable energies, construction and tourism). These linkages can strengthen the internal supply of sustainable minerals and materials and unlock local innovation through technologies and circular practices in the mining process that increase environmental outcomes and international competitiveness of the entire economy.

*Developing national and international networks*

The new mining strategy should also help Andalusia's mining ecosystem to enhance co-operation with national and international actors. Given the autonomy of Spanish regions to develop their own mining strategy, increased co-ordination with other regions can be instrumental to share good practices for mining development, develop joint projects and access greater funding. The strategy can include specific actions to formalise the co-operation with mining Portuguese regions and reinforce Andalusia's role in the EU and other international initiatives. For example, by highlighting the particularities of its mining value chain, Andalusia can become the bridge between EU mining sustainable practices and Latin American or North African markets. Furthermore, as the only region sharing the Iberian Pyrite Belt with Portugal,

Andalusia can set up a partnership with regions in Portugal to structure a cross-border mining project and reach foreign investors and EU funds with a unified voice.

## Recommendations

### ***Mobilising the strengths of Andalusia's mining ecosystem to increase competitiveness and attractiveness for firms and workers***

For this, the regional government should:

1. **Update and improve the accessibility of Andalusia's geological information**, in collaboration with the Geological and Mining Institute of Spain. This involves improving the geological information on Andalusia's mining website, with special attention to the mapping of critical minerals.
2. **Facilitate and strengthen links with African and Latin American mining jurisdictions** to become a gateway to and from the EU in sustainable mining processes and technologies. In collaboration with mining business associations, this involves promoting networking and partnerships with those jurisdictions and their established companies as they seek to adopt sustainable mining practices and promote responsible sourcing of minerals to Europe.
3. **Better integrate urban and infrastructure plans with mining development plans** to improve the movement of goods and services for the mining sector as well as to avoid land use conflicts. This co-ordination could aim to enhance the transport efficiency of goods (e.g. ports, roads and railways) for metallic and non-metallic mining.
4. **Make the most of the local mining identity and heritage** to strengthen community acceptance and information on mining activities, while enhancing the mining business ecosystem, by:
  - *Enhancing the communication of mining benefits among local communities.* To this end, the regional government together with mining business associations can promote dialogue among citizens and other actors (e.g. non-governmental organisations [NGOs], universities) within Andalusia's Mining and Minerals Hall event and before every mining project to share experiences on how to maximise the benefits of mining ventures for the local community.
  - *Partnering with universities and other local actors* (citizens, municipalities and business representatives) to better engage with interest groups with a negative perception of mining.
  - *Improving the links between corporate social responsibility programmes of mining companies and regional development programmes* through shared projects for local communities and ad hoc communication strategies.

### ***Addressing challenges in Andalusia's mining ecosystem to unlock growth opportunities and assist the EU climate goals***

For this, the regional government should:

5. **Enhance innovation within Andalusia's mining value chain** to generate sustainable mineral transformation processes and technologies, by:
  - *Promoting service innovation activities in the mining value chain.* Specific actions include:
    - Providing capacity and networking support to increase and upscale knowledge-intensive mining service providers. This requires establishing knowledge exchange mechanisms with foreign-based mining and manufacturing firms to upscale services offered by local mining service providers while helping them meet high standard procurement requirements. This should also involve developing capacity-building programmes for service providers on

circular processes and technologies for environmentally sustainable metallic and non-metallic mining.

- Establishing a testbed for mining firms and service providers to co-create projects and experiment. This can be beneficial to build collaboration among metallic and non-metallic mining providers and firms. Andalusia's mines could be the lifelong learning laboratory for the local mining value system, inspired by the experience of Australia or Sweden.
  - **Boosting the role of educational institutions and the public research sector** to support innovation and entrepreneurship for environmentally sustainable mining. Specific actions include:
    - Strengthening partnerships with universities in the region to promote research and academic programmes on technologies and circular practices that reduce carbon emissions in the mining value chain. This includes collaborating with universities to align their research programmes with regional mining strategy goals and industry needs. The regional government can learn from the partnership of Karlstad University and Värmland Region in Sweden.
    - Acting as a broker to facilitate the creation of an institutional platform to conduct R&D in mining. The platform could be co-coordinated by a body of private, academic and public representatives and should work through demand-driven projects from the private sector. This R&D platform can co-ordinate the testbed for the co-creation of projects, develop partnerships with existing regional incubators and promote intrapreneurship activities for companies and knowledge transfer between metallic foreign-based and non-metallic firms.
  - **Improving skills in Andalusia** to prepare its workforce and youth population for the future needs of the mining industry and attain high-value-added jobs. Specific actions include:
    - Boosting training programmes in partnership with universities and industry associations to prepare the regional workforce and young generations for the upcoming demand of knowledge-intensive and environmentally sustainable mining activities. This could also involve vocational formation on traditional non-metallic mining activities. Practices from the Canadian Mining Innovation Council's "ReThink Mining" initiative can guide Andalusia.
    - Involving the young population in mining activities through a greater communication of employment opportunities in mining and promotion of internship programmes within the industry.
- 6. Upscale and guide SMEs towards higher-value-added activities** in order to increase resilience and offer stable sources of income in the local economy, by:
- **Strengthening regional technical support programmes for SMEs to improve networks with large mining companies, build capacity and promote the internationalisation of mining providers and small non-metallic mining firms.** This involves enhancing financial (e.g. grants, co-financing) and training programmes for digital transformation and project collaboration with universities and firms.
  - **Reducing further administrative obstacles to SME creation and growth.** This involves strengthening capacity-building programmes to help SMEs navigate the regulatory environment in the region and promoting the digitalisation of administrative and fiscal processes.
- 7. Improve the mining regional regulatory framework and permit award process** to enhance competitiveness and local community acceptability, while ensuring environmental protection. This action requires close collaboration with the national government.
- For this, the regional government should:
- **Establish a formal co-ordination mechanism within the regional government to evaluate and deal with administrative processes for mining.** This institutional tool (e.g. a one-stop-shop, a single decision-making body or a branch in the Project Accelerator Unit of Andalusia<sup>2</sup>) should

gather officers from different regional ministries to accelerate mining administrative processes and improve co-ordination across regional regulations (e.g. environmental and land use) and with national and European legislation. This mechanism can also take stock on expert knowledge (universities or specialised consultants) to issue formal recommendations on the permit award process of mining projects.

- *Create specific programmes to train government staff and provide digital solutions to improve mining administrative processes.* These training programmes would benefit from partnerships with business associations from metallic and non-metallic mining to update the administration on the needs and benefits of a new type of mining operation.
- *Set clear administrative timelines to deal with applications for new and expanded mining projects, including times for environmental evaluations.* Timelines can be set in the regional mining strategy as a clear goal for improvement. Andalusia can find inspiration in the roadmap set by Canada.

For this, the regional government should:

- *Update the national mining regulatory framework* to make it more efficient and better integrated with other sectoral regulations, including environmental regulations and land use planning.

### ***Improving national co-ordination on mining to help attain EU strategic goals and support national and regional development and well-being***

For this, the Spanish national government should:

- 8. Develop a national strategy on raw materials or mining.** This strategy should build on the ongoing process of developing the *road map for the sustainable management of raw materials*. The national strategy should include a long-term vision for mining development, clear mechanisms for co-ordination with other national development policies, tools to promote environmentally sustainable mining processes and technologies, as well as strategies to attract investors, improve communication and boost the well-being of local communities.
- 9. Improve the financial and institutional capacity of the Geological and Mining Institute** to help co-ordinate the national mining strategy and boost its research and exploration activities. This institute can also help promote the Spanish mining value chain internationally. Spain may find of interest the structure and role of the Geological Survey of Finland.

### ***Strengthening Andalusia's 2021-27 mining strategy to make the regional mining value chain a frontrunner in environmentally sustainable mining and an engine to increase income and well-being***

For this, the regional government should:

- 10. Define a unified vision of the role of mining for regional development by:**
  - Agreeing on a clear vision for mining development in the updated mining strategy. This vision should be built through a consensus with different local actors, have a long-term timeline (e.g. 2050, in line with the EU Green Deal) and aim to mobilise all of the comparative advantages of the region.
  - Enhancing the mining brand of the region and creating a plan to promote it internationally as part of the mining strategy. This brand and its promotion activities need to be developed and co-ordinated with other branding strategies and actors in the region. The brand should aim to attract new firms and skilled workers, based on an image of an innovative business environment that produces essential materials and know-how for the low-carbon transition.

- 11. Establish concrete objectives with measurable targets and a timeframe of actions in the mining strategy.** This includes refining existing indicators and creating a timeframe for objectives by indicating which axis and action lines are a priority for the next few years (e.g. 2021-27) and which are inscribed in a longer timeline (2030).
- 12. Strengthen the monitoring framework of the new mining strategy by:**
- Differentiating among outcome and output indicators to measure long-term objectives and operative tasks differently.
  - Developing horizontal indicators that measure transversal objectives in the strategy and avoid duplication across specific tasks, while creating complementarities.
- 13. Improve the involvement of municipal governments and local communities in the mining strategy by:**
- Aligning the new mining strategy with municipal development plans. This can be done through frequent, formal dialogue sessions with municipal governments and their early involvement in the development process of the strategy and its monitoring.
  - Improving co-operation with municipalities through the proposed institutional platform for R&D in mining and the multi-stakeholder co-ordination platform for mining development.
  - Including in the new strategy a guideline/toolkit to structure and implement benefit-sharing mechanisms for mining in Andalusia. This includes identifying the models used in the region and facilitates capacitation programmes for companies and communities to make the most of the benefit-sharing process.
- 14. Unlock synergies with other regional policy strategies and promote local networks to support a regional mining cluster based on innovation by:**
- Establishing a formal mechanism within the regional government to better co-ordinate the different sectoral policies (e.g. aeronautic, industry, construction) with the aim to mobilise the innovative potential of the mining sector. This mechanism should gather representatives from different units of regional and municipal governments.
  - Promoting in the new mining strategy the creation of a multi-stakeholder platform for mining development that gathers all relevant actors in the mining value chain to identify synergies and projects of common interest. This should include representatives from companies of different sizes, universities and the third sector as well as local governments. This group should have a role in the preparation and monitoring of the mining strategy. The platform can help promote network activities and the international visibility of actors. For this, the regional government can get inspiration from the Mining Finland programme.
- 15. Boost collaboration with Spanish and Portuguese mining regions as well as with EU mining initiatives to promote joint mining projects, enhance knowledge and funding access by:**
- Developing partnerships with regional mining initiatives in Spain (e.g. the Iberian Sustainable Mining Cluster). The new mining strategy should map out the existing regional mining initiatives and specify the mechanisms to involve Andalusia in those initiatives to articulate common projects and promote a co-ordinated approach to reach European support programmes.
  - Defining the new mining strategy tools and flagship projects to materialise the co-operation with Portuguese regions located in the geological formation of the IPB. This can involve a common strategy to attract investors and reach EU funding.
  - Taking an active role in the EU mining networks to promote common projects with EU mining regions and consolidate Andalusia's role as the bridge for EU mining innovation and sustainable practices with Latin American and North African markets. This collaboration should also aim at improving the competitiveness and internationalisation of local SMEs in the mining ecosystem.

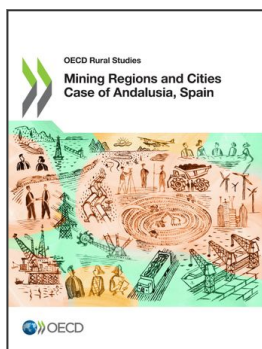


## Notes

<sup>1</sup> The OECD regional database collects and publishes regional data at two different geographical levels, namely large regions (Territorial Level 2, TL2) and small regions (Territorial Level 3, TL3). Both levels encompass entire national territories. With some exceptions, TL2 regions represent the first administrative tier of subnational government (i.e. states in the United States or *régions* in France). TL3 regions are smaller territorial units that make up each TL2 region. Andalusia is composed of eight TL3 regions: Almeria, Cadiz, Cordoba, Granada, Huelva, Jaen, Malaga and Seville

<sup>2</sup> In 2019, the regional government of Andalusia created the Project Accelerator Unit to accelerate the administrative procedures of strategic projects. This unit promotes the streamlining of all the procedures of the Andalusian public administrations to process all projects of regional interest effectively and in less time (See Chapter 3).





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