

# Mining Underground Heritage. The (incomplete) experience of the Southern Spain

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Campus Mare Nostrum

**WORKSHOP UNDERGROUND CULTURAL HERITAGE AS A  
DRIVEN FOR REGENERATION. Strengthening Local and  
Regional Participación in EU Programs.**

**Naples. November 8th -9th, 2016**

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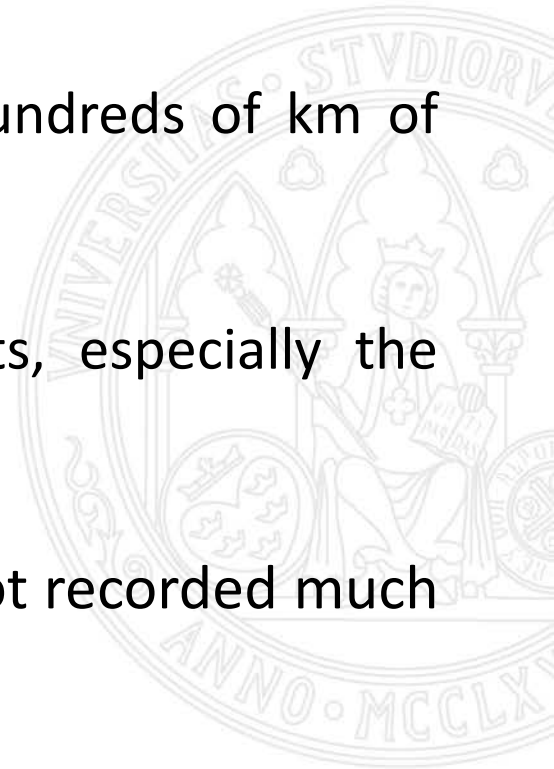


➔ **Historia Empresarial, mercados y desarrollo productivo en la minería española contemporánea. Plan Estatal de Investigación Científica y Técnica y de Innovación 2013-2016. Project (HAR2014-56428-C3-3-P).**

➔ **The Impact of Limited-Liability Business Organizations across the Mediterranean: Italy, Turkey and Spain (14452010). Plan Estatal de Investigación Científica y Técnica y de Innovación 2013-2016 (2017). Project (HAR2013-42013-R).**

# A huge underground heritage

- After thousands of years of activity, mining has left a huge underground heritage.
  - The largest underground heritage, with hundreds of km of tunnels, shafts and other excavations
  - In addition, it is mixed with other assets, especially the geological.
  - Although that its size is unknown and is not recorded much of the location of underground galleries.



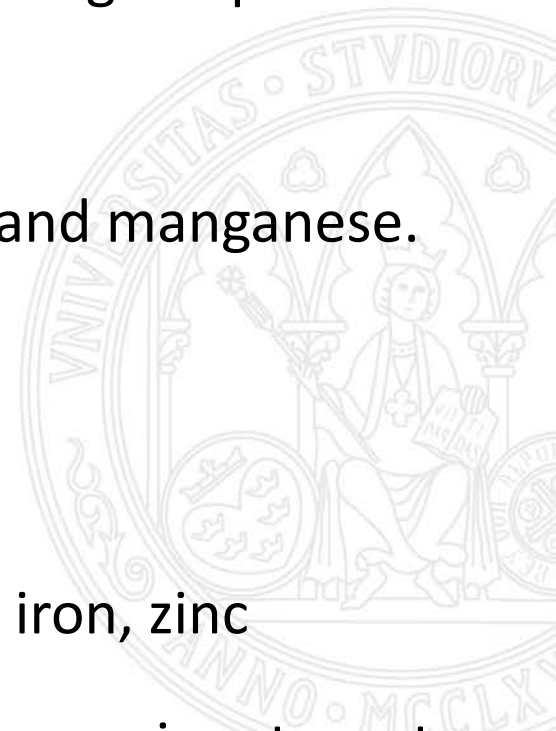
# A huge underground heritage

- There are very successful examples of utilization of this heritage, such as the salt mines "Wieliczka" (Krakow-Poland): over one million visitors per year.



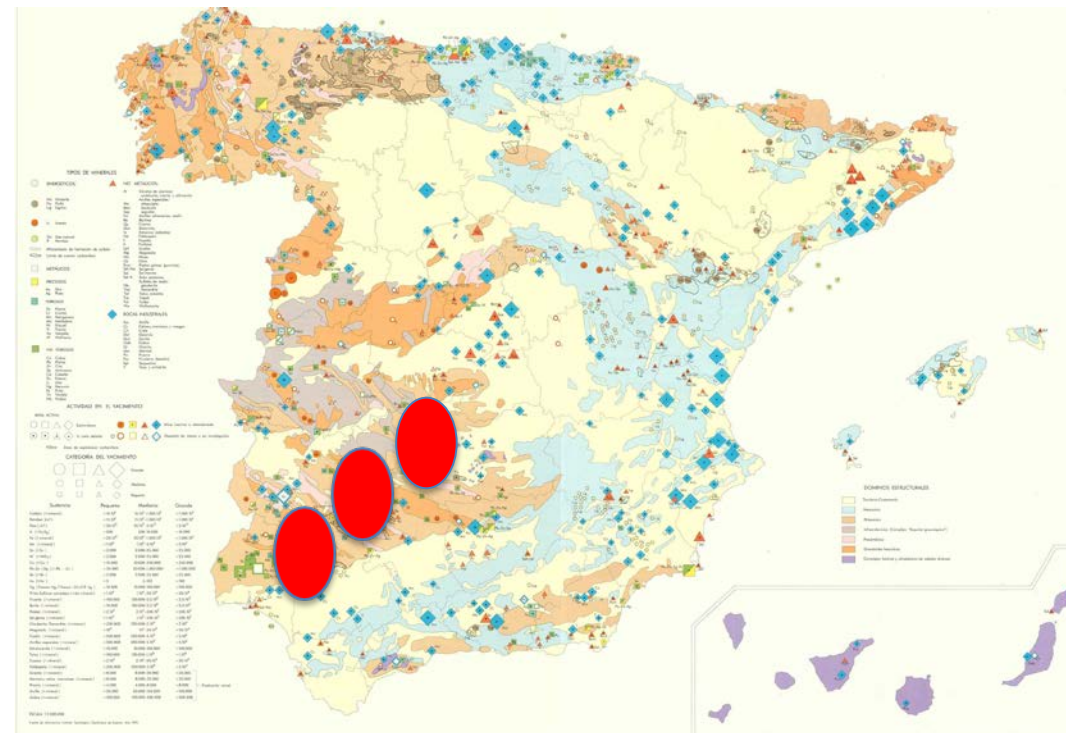
# Mining in Spain

- Also in Spain Mining activity happened since antiquity with important material remains. Golden age of mining in Spain in the 19<sup>th</sup> and 20<sup>th</sup>
  - Leading producer of lead, copper, mercury and manganese.
  - Spain was among the first in iron and zinc.
  - Geographical distribution of mining:
    - South: Metal mining lead, silver, copper, iron, zinc
    - North: Energy mining -> coal. Besides iron, zinc, tungsten, manganese and potassium salts.



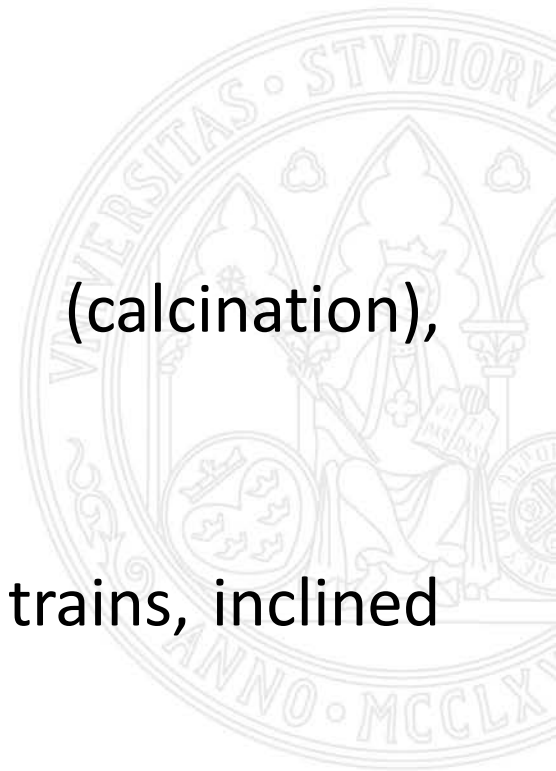
# Mining in Spain

- Spain has mines world-famous
  - Rio Tinto-Huelva (current name of one of the largest multinational mining)
  - Almadén-Ciudad Real
  - Peñarroya – Córdoba
- In the last decades of the 20<sup>th</sup> C most of the historic mining Spain closed -> concern for the valorization of this heritage



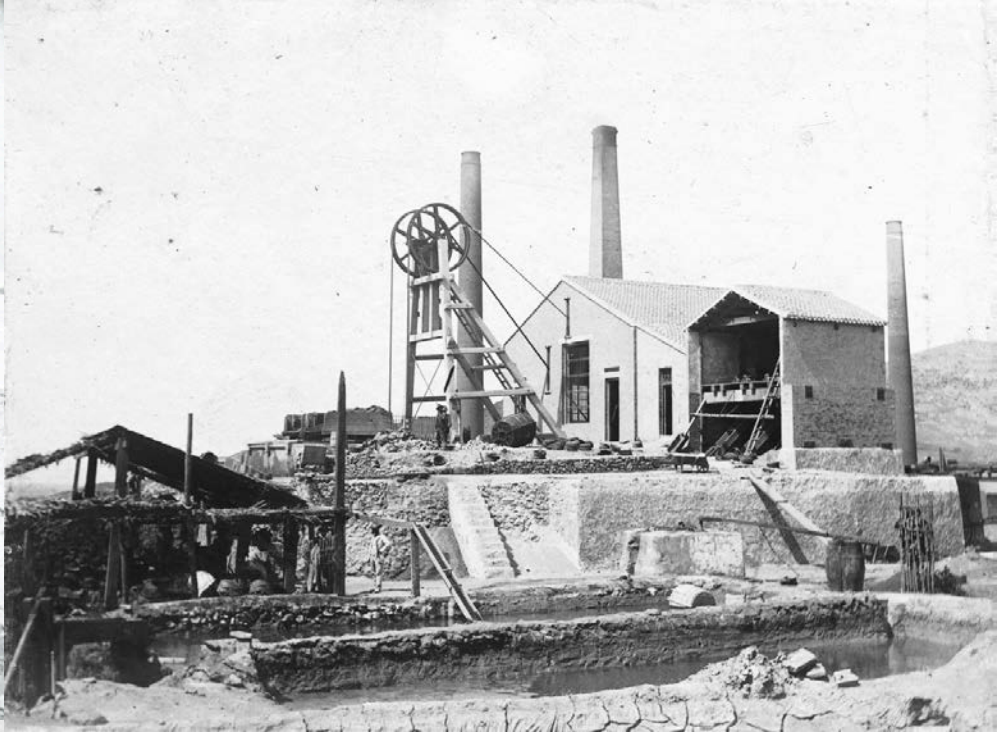
# Mining in Spain

- The mining work is carried **in** and **out** of the Earth's crust
- Main activities carried out :
  1. Extraction: underground and opencast
  2. Selection and cleaning of minerals
  3. Concentration (gravimetric, ovens (calcination), differential flotation ...)
  4. First casting ( f.e. in the case of lead)
  5. Transfer, trade and commerce (mining trains, inclined planes, aerial cables, loading docks ...)



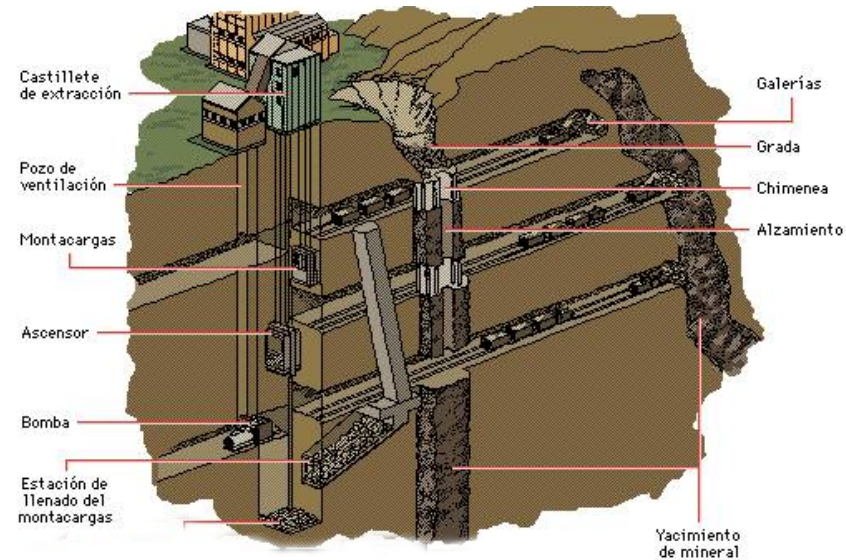






# Minería de interior

- Quarries, short ...
- Underground mining
  - Wells
    - Entry and exit for miners
    - Transportation of ore
    - Ventilation
    - Other functions
- Galleries
- Cavities for various works and activities inside the mine.
- Underground mining can not be (completely) separated from the outside mining
  - Several facilities are dedicated to transport the ore/products to and from abroad: derricks, hoists, winches





# Underground mining heritage

- An immense heritage... although a heritage also problematic.
- Issues:
  1. Security: conservation of galleries, state of the trench shoring, presence of gases (firedamp, carbon dioxide ...).
  2. Maintenance: need for an variable expense (depending on many circumstances) so that the galleries could have a minimal security.
  3. Floods: the water enters into the mines once it stops performing drainage work.
- Must be:
  1. Chosen which parts of this heritage should be preserved and used for different purposes.
  2. Cataloged all other mining areas that are not preserved.



Tunnel José Maestre (Mayor of  
Cartagena, Minister of Spain)  
Was built in 1957 Peñarroya  
Metalurgic Mine Company  
(Portman-La Unión, Cartagena



# Mining and city

- The Mining centers (sometimes) compete with urban centers
- Sometimes population center has grown alongside or even over the mine exploitation
  - Following examples



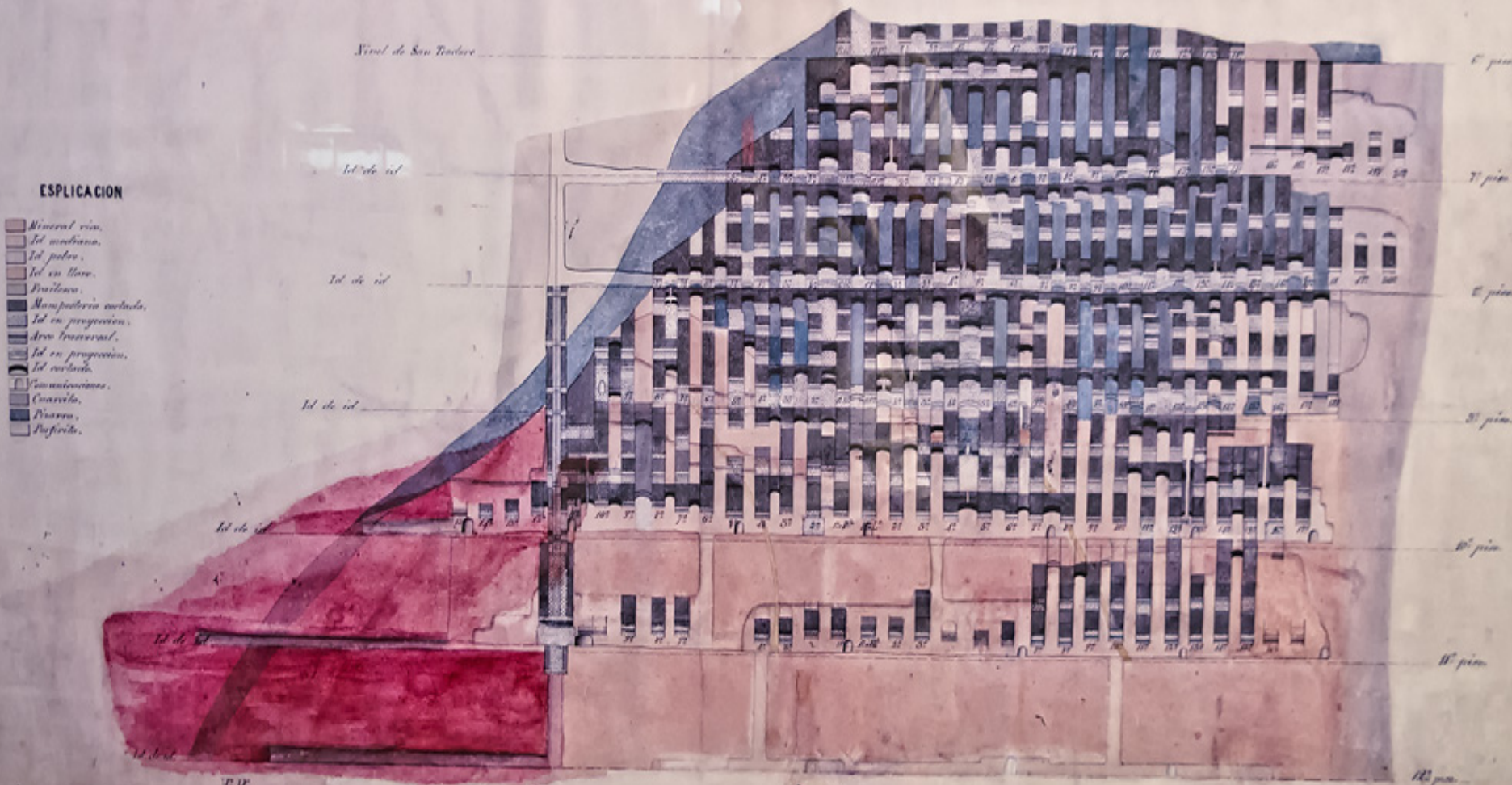
W 0 M A  
T 1 1 A

# MINAS DE ALMADEN

Corte longitudinal por los ejes de las galerías generales y su desarrollo

## CRIADERO SAN NICOLAS HASTIAL DEL NORTE

ROBERTO JANEZ  
PHOTO  
8400 WACOM



### ESPLICACION

- Mineral vivo.
- Id. muerta.
- Id. puros.
- Id. en llave.
- Bastones.
- Manposturas ocultas.
- Id. en progresion.
- Arco horizontal.
- Id. en progresion.
- Id. oculto.
- Comunicaciones.
- Cavallets.
- Dineros.
- Profundo.

F.B.  
El Bruto Justitia

Escala  
0 20 40

Almaden 28 de Octubre de 1837  
El Bruto Justitia



# ALMADÉN-Ciudad Real



Parque Minero de Almadén

Museo del Mercurio

Plaza Ruiz del Alda

Plaza Escosura

Plaza Manuel de Falla

Instituto de Educación Secundaria les Mercurios

Escuela de Ingeniería Minera e Industrial

TALLER CGA

Plaza Jesús Muñoz

Plaza Dr. Fleming

Supermercado Sánchez Gamo

Calle Ciudad Real

Calle Felipe Asensio

Av. Puerto Llano

Arroyo de Fuente Vieja

Av. del Norte

Av. del Norte

Av. del Norte

Calle los Mineros

Calle Bajada al Pozuelo

Calle Bajada al Pozuelo

Calle Miguel Hernández

Calle Bajada al Pozuelo

Calle Bajada al Pozuelo

Arroyo del Valle de Juan Gil

Calle Bajada al Pozuelo

Arroyo del Valle de Juan Gil

Calle Granada

Calle Lérica

Calle Lugo

Camino de la Huerta de Parra

Calle Cuernca

Calle Cáceres

C-424

N-502

N-502

N-502

N-502

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N-502

Camino de P...

Vereda de Ba...

# MINAS DE RIOTINTO- Huelva



Club de Golf  
Corta Atalaya

Casa Rural Riotinto  
Victorian House

Alto de  
la Mesa

Geotexan

Parque Minero  
de Riotinto

Minas de  
Riotinto

HU-6104



# LA UNIÓN-

## Murcia

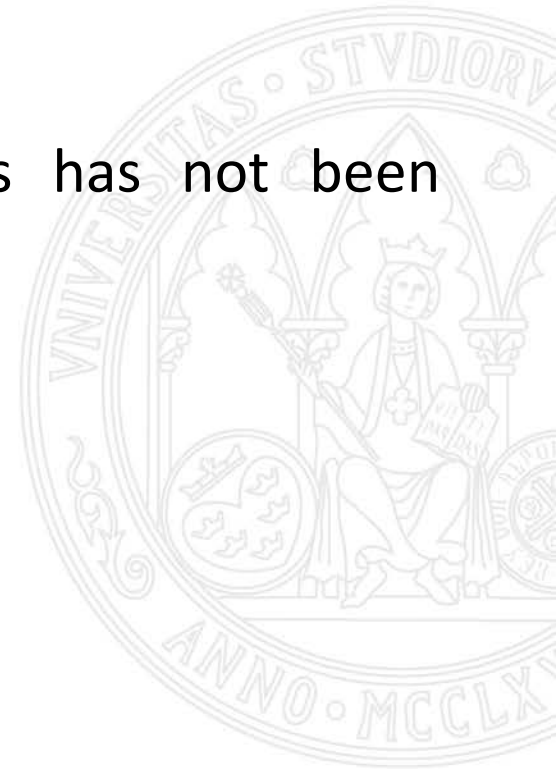
# Mining and city

- There is a relationship between mining and urban environment that is has been manifested itself in different ways
  - Abundance of monuments to mining. Almost all cities/villages have had some mining work has any (is the honoree activity)



# Mining and city

- Need to pay attention to the interests and concerns of the population
  - Mainly, the opinion to the inhabitants has not been consider.



- The industrial mining heritage has a great value (as already mentioned)
  - High social value
- It would be necessary to develop a **database of mining and underground work.**
- Also to **share the experiences of recovery and valorization (good practices).**



- They have developed interesting valorisation initiatives, but:
  1. There is still an important asset to build on
  2. The initiatives have been (generally) isolated, and with little contact with the reality of the areas where they are implanted.
- Lack of connection
- Lack of projection about new ways to harness this heritage



**FESTIVAL  
INTERNACIONAL  
DEL CANTE  
DE LAS MINAS**

LA UNIÓN

3 AL 13  
AGOSTO  
2016



FESTIVAL  
INTERNACIONAL  
DEL CANTE  
DE LAS MINAS





# Valorization of underground mining heritage: A wide range of possibilities

1. Industrial heritage
2. Tourism -> ecomuseums, mining parks, interpretation centers, mining museums, theme parks ...
3. Adventure activities: caving, travel galleries ...
4. Educational activities: educational opportunities
5. Place of research: history, technology ...
6. Geology: tourism, research, heritage ...
7. Archeology -> linked especially to the old mining
8. Paleontology
9. Photograph
10. Use of spaces for events, performances, performances ...
11. Computer simulation, virtual tours, video games [ <https://www.youtube.com/watch?v=2WlQNzs4K1o> ]
12. Other (creative) uses. E.g. "The National Archives" have located part of their funds in a salt mine. [ <https://www.theguardian.com/uk/gallery/2010/aug/10/cheshire-salt-mine-national-archive> ]



# Valorization of underground mining heritage: A wide range of possibilities

UNIVERSIDAD DE  
MURCIA

- The mine in Winsford, stretches to 100 miles and is still growing as approximately 1m tones of salt are mined every year. The unique space now houses Deep Store, an ideal facility for documents as it has consistent temperature and humidity and is naturally free from ultraviolet light, rodents and flooding. It could house every piece of archive material in the UK. Deep Store currently stores more than 1m assets and documents, and is being used for some of the National Archives.



Source: <https://www.theguardian.com/uk/gallery/2010/aug/10/cheshire-salt-mine-national-archive>

# Tourism: mining parks

- There is a long experience in the enhancement of underground mining heritage. Main use: **mining parks**
- Sections of a mining park:
  1. Visits (also guided tours)
  2. Travel in mining railways
  3. Interpretation centers
  4. Mining Museum
  5. Archive
  6. Other activities: p. eg. more specialized visits to area more difficult access ...

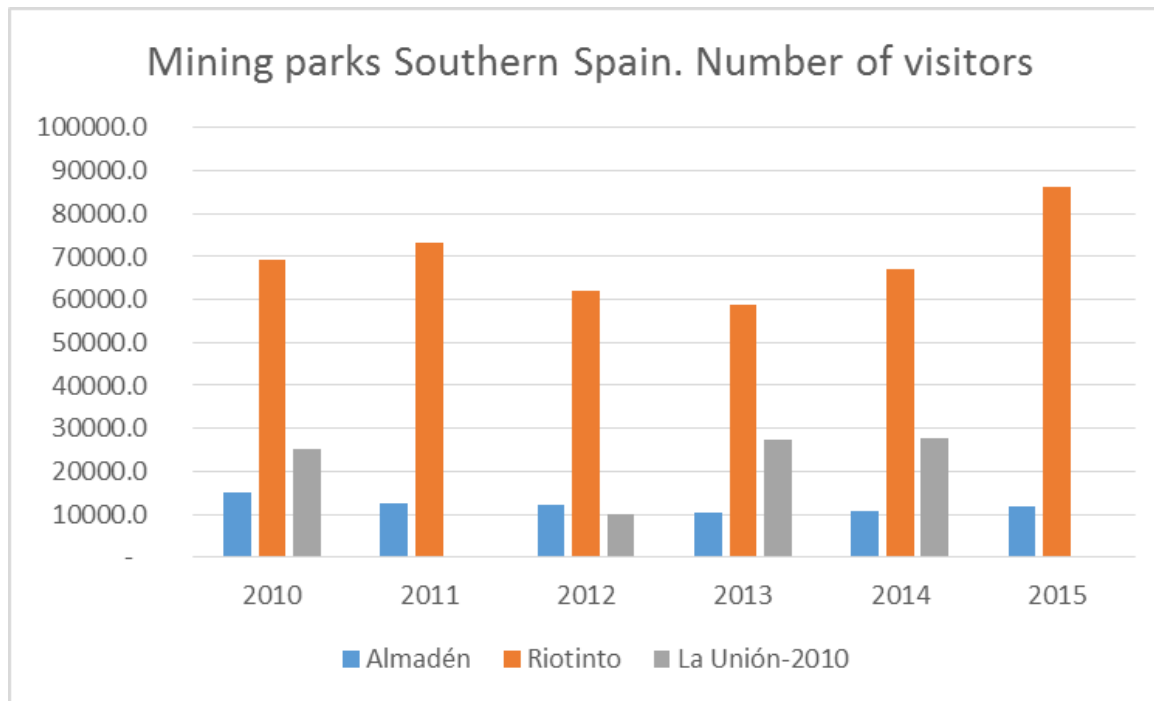


# Tourism: mining parks

	2010	2011	2012	2013	2014	2015
Almadén	14.952	12.703	12.184	10.190	10.829	11.777
Riotinto	69.387	73.149	62.092	58.775	67.148	86.287
La Unión-2010	25.000		10.012	27.329	27.749	



# Tourism: mining parks



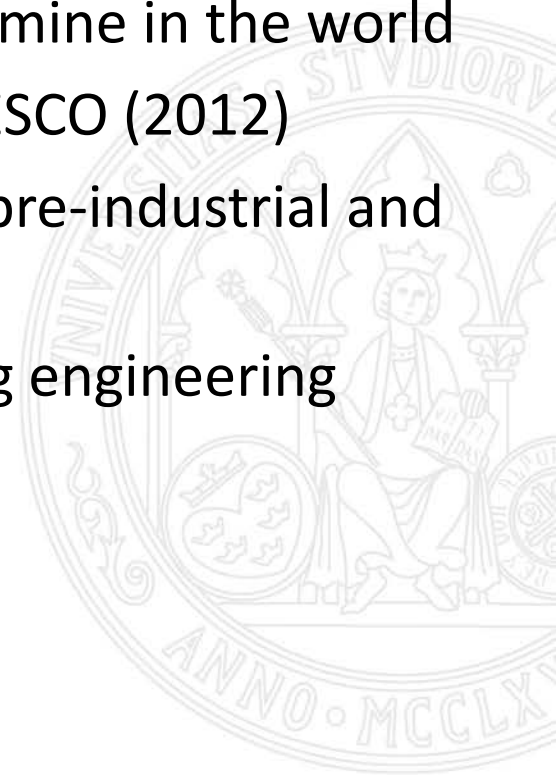
# Example: Almadén

- **PROS:**


1. Mining park linked to a city with mining activities for centuries.
  - It has been the most important mercury mine in the world
2. Declares Patrimony of Humanity by the UNESCO (2012)
3. Wide range of activities and places to visit (pre-industrial and contemporary times)
4. There is an university in the city, with mining engineering studies

- **CONS:**


1. The distance to touristic resorts.
  - Within Spain
  - Only few complementary tourism resources.





 Parque Minero de Almadén  
[www.parqueminerodealmaden.es](http://www.parqueminerodealmaden.es)

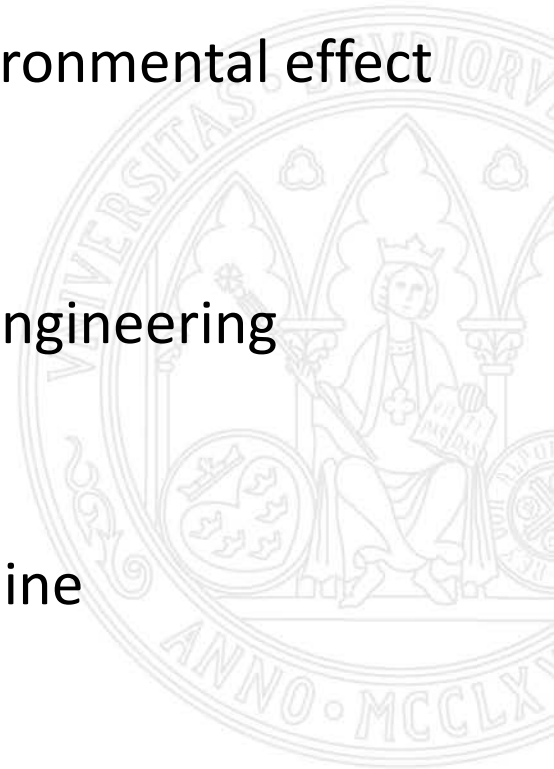


 Parque Minero de Almadén  
[www.parqueminerodealmaden.es](http://www.parqueminerodealmaden.es)

# Example: Sierra de Cartagena-La Unión

- **PROS:**

1. Place long mining tradition, with a variety of minerals, particularly lead, zinc and iron.
  - The local population is worried for the environmental effect and contamination.
2. Declared Historical Site of Cultural Interest.
3. There is also a nearby university with mining engineering studies.
4. An interesting valorization of this heritage:
  1. Mining Park, visiting an underground mine
  2. “Cante de las Minas” Festival.





# Example: Sierra de Cartagena-La Unión

- **PROS:**

5. There is a great potential, because the site is located along the coast, with a large tourist population movement.

- **CONS:**

1. It has developed very few activities

- the local population does not feel very identified with the festival.



# LA UNIÓN



1. PARKING Y CENTRO VISITANTES



2. TREN MINERO



3. CARRETERA DEL 33



4. FILÓN MINA REMUNERADA



13. SERPENTÍN



12. HORNO DE TOSTACIÓN



11. BALSA DE LODOS



10. LAVADERO MINA REMUNERADA



9. MIRADOR



8. BAR



5. MINA AGRUPA VICENTA



6. MINA PABLO Y VIRGINIA



7. POLVORÍN Y SALA COMPRESORES



- TREN MINERO
- CTRA. DEL 33 (ruta a pie o en bici)
- SENDERO A PIE

A PORTMÁN →



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