

Abandoned Mines

Abandoned mines are an environmental time bomb. Mining activities cause serious environmental damage to freshwater ecosystems through the **discharge of polluted effluents**, which may contain high concentrations of heavy metals or salts, depending on the type of mine. This environmental problem is especially critical for abandoned mines, because there is no company in charge of treating these mining effluents, leaving a legacy of local and global pollution.



Fig. 1: Uncovered potash waste dump with drainage water collecting system in Germany

The LIFE DEMINE Project

The LIFE DEMINE project aims to demonstrate and disseminate the technical and economic feasibility of **decreasing the overall environmental impact** caused by mining effluents from abandoned mines in water bodies. This will be done by:

- Developing and testing an innovative and versatile treatment process based on membrane processes and electrocoagulation at bench scale and in two pilot plants,
- Characterizing the composition of several mining effluents,
- Reviewing the current legislation applicable to mining wastewater at European, German, British and Spanish level,
- Assess the efficiency of the technology in reducing the ecological impact on waterbodies using aquatic biofilm as biological indicator,
- Increasing awareness of the environmental problem

The Treatment Process

The plant process design is modular and enables configuration to be adjusted to site requirements

- Built modules: Electrocoagulation module 1 & 2, Process module, Mixing module
- To be completed: Filtration Module and Control module

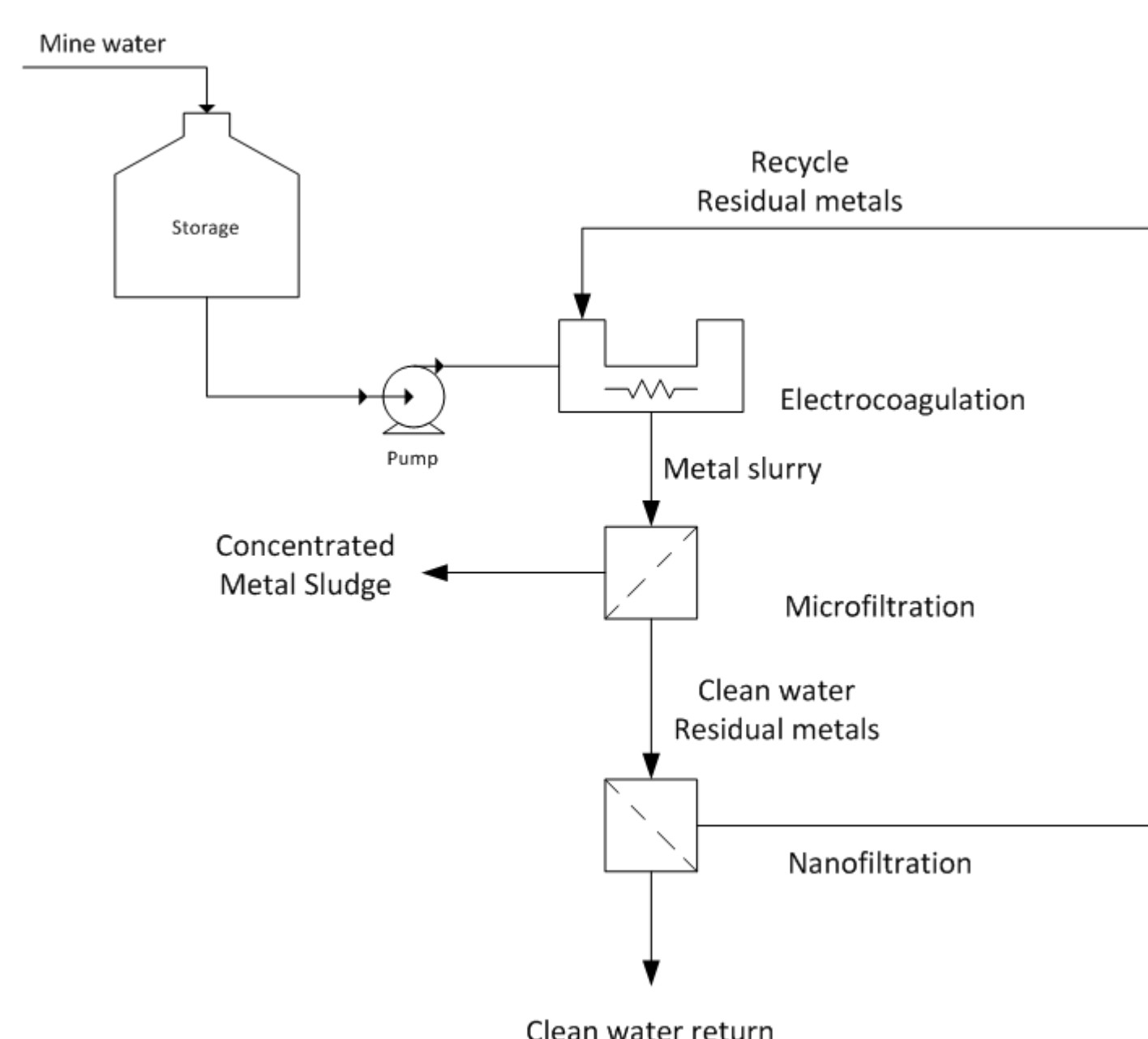


Fig. 2: Treatment process plan (Elentec)

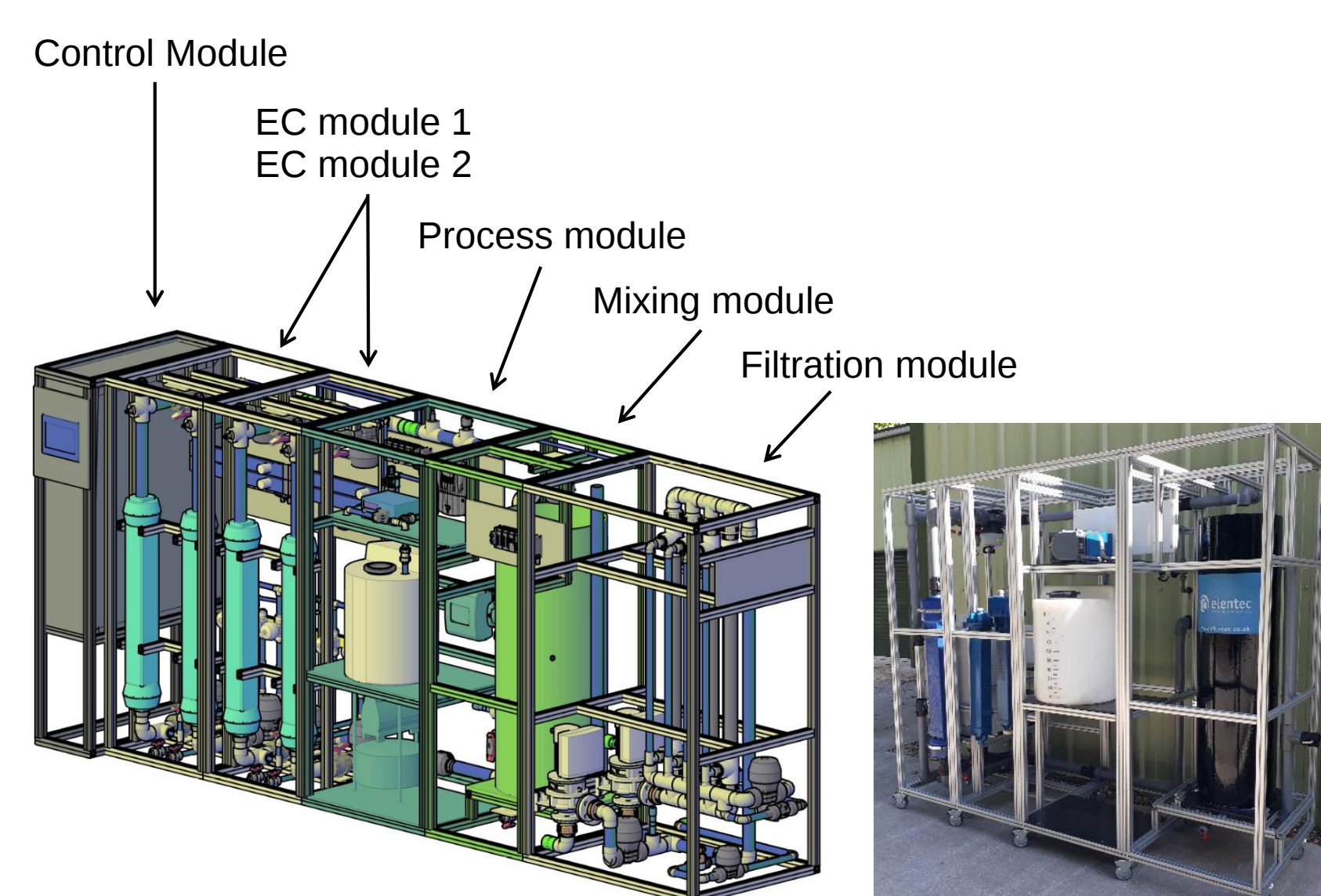


Fig. 3: Modular design (Elentec)



Fig. 4: Pilot plant (work progress)

Data of several mining effluents

In total 5618 datasets were collected and data of 90 locations in 10 different countries is available.

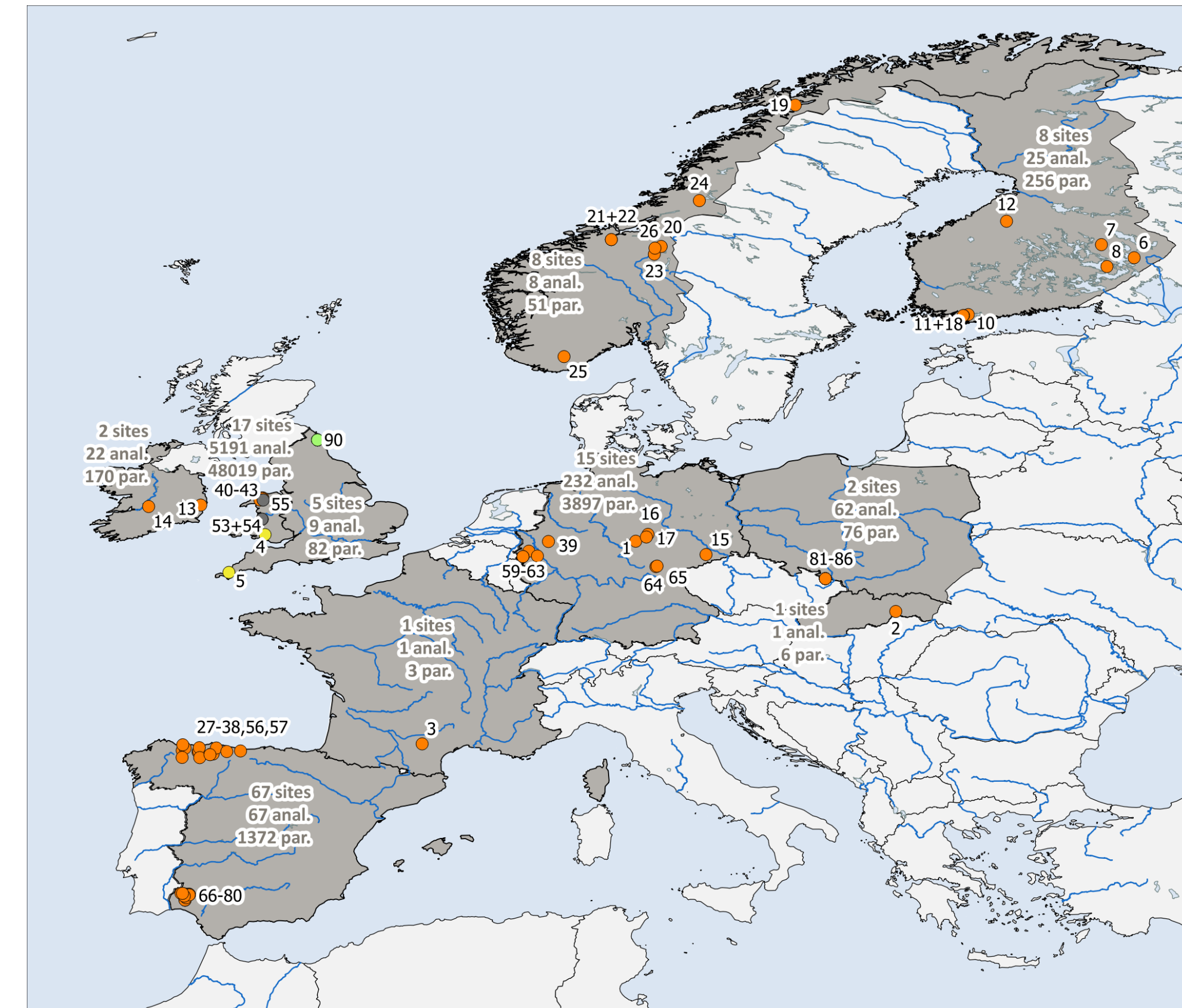


Fig. 5: Overview of collected data (number of sites, analysis and parameters)

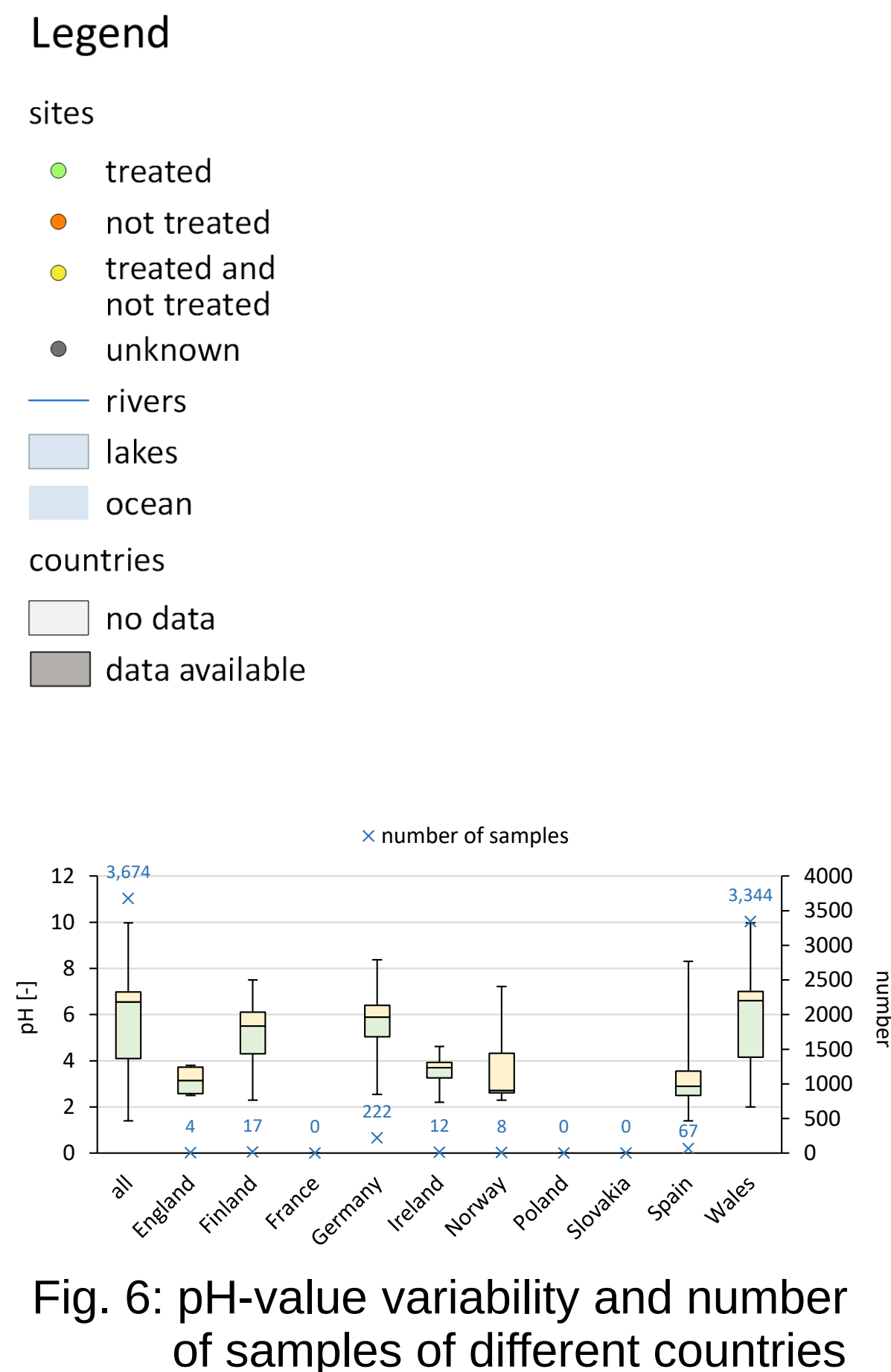


Fig. 6: pH-value variability and number of samples of different countries

Policy and legislation assessment

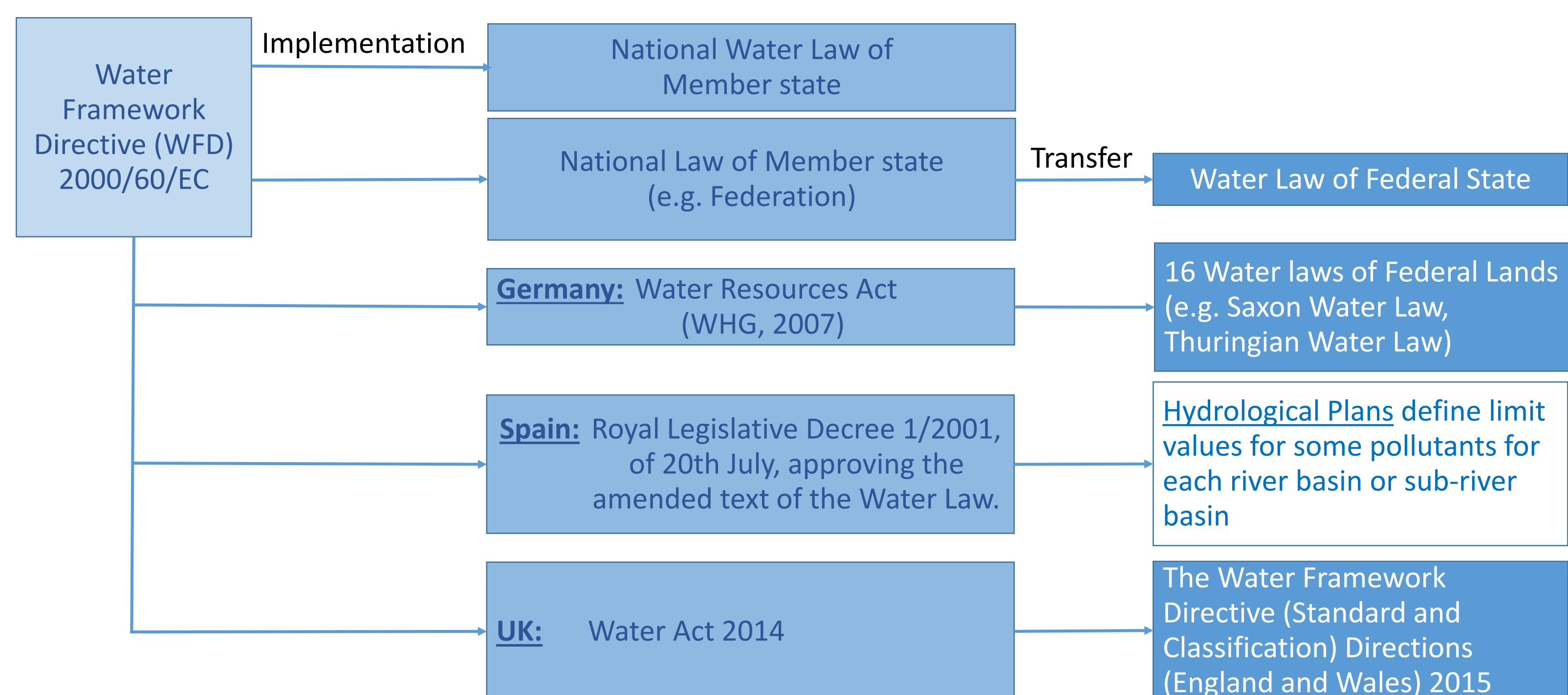


Fig. 7: Overview of the policy and legislation assessment of the project partner's countries

The Demonstration sites



Fig. 8: Pilot plant at Frongoch mine site

Frongoch mine (Wales)

- Abandoned lead and zinc mine
- Metal effluent
- The pilot plant will be operating in Wales from May 2019 to April 2020



Fig. 9: Menteroda site preparing for pilot plant

Menteroda (Germany)

- Abandoned potash mine
- Salt effluent
- The pilot plant will be operating in Menteroda from June 2021 to October 2021