Energy rationalization in foundries: a comparison between European and Italian experiences

Roberto Ariotti

CAEF, European Foundry Association

President of the Executive Committee

ENERGY AUDITS AND ENERGY EFFICIENCY: FOCUS ON ENERGY INTENSIVE SMES IN EUROPE
EUSEW-LEAP4SME EVENT

Application of the 2012/27/EU directive in european countries

According to the paragraph 4 of the article 8 of Directive 2012/27/EU Member States shall ensure that **enterprises that are not SMEs are subject to an energy audit** by 5 December 2015 and at least every four years from the date of the previous energy audit.

Enterprises that are not SMEs and that are implementing an energy or environmental management system (ISO 50001:2018 or 14001:2015) shall be exempted from the requirements of paragraph 4 if that the management system concerned includes an energy audit).

Member States shall develop programs to encourage SMEs to undergo energy audits and to facilitate the implementation of the recommendations

Application of the directive	France	Germany	Italy	Spain
Energy audit in non SMEs	Yes	Yes	Yes	Yes
Energy Audit in SMEs	No	No	Yes	No
Voluntary certifications in non SMEs	Yes	Yes	Yes	Yes
Voluntary certifications in SMEs	Yes	Yes	Yes	Yes

The German application of the European directive

In Germany, for SMEs an energy management system (EnMS) is not provided in general. There is a special legislation explicitly excludes it.

However, it is a prerequisite for:

- a limitation of the levy according to the Renewable Energy Act (EEG).
- a limitation of the national CO_2 price.

Only non-ferrous foundries with more than 250 employees (rare!), have carried out an energy audit or have also installed an ISO 50001 EnMS.

Now there are **approximately more than 200 German foundries (out of 550) certified with the ISO 50001**.

The French application of the European directive

In France the nation regulation strictly respects the Energy efficiency directive.

The audit is only mandatory for companies with more than 250 employees or more than 50 M€ turnover.

Companies certified with ISO 50001 do not have to perform the energy audit.

Some enterprises that are not SMEs prefer the certification ISO 50001:2018 than energy audit because it helps to build an energy efficiency policy.

No evidence of companies with less than 50 employees that have the certification ISO 5001:2018.

The Spanish application of the European directive

In Spain energy audits are not mandatory for SMEs.

Many companies that are not SME have certifications such as ISO 50001.

Now the ISO 50001 is not common for SMEs, with the exemptions of the leader market, but the **tendency is that more and more foundries are working to get certifications and audits**.

The peculiarities of Italian foundries

In Italy, the Directive 2012/27/EU has been implemented with the Legislative Decree n. 102 of 4 July 2014 (with subsequent amendments).

1. The application of the energy audits is mandatory also for SMEs (energy intensive companies) - To our knowledge only in Italy.

2. Due to the obligation of previous point voluntary certifications are not widespread.

3. High cost of electricity (on average 20% higher than in France and Germany).

4. Enterprise's structure: mainly small to medium-sized (in Germany there is a prevalence of large companies).

Assofond guidelines

Due to Italian peculiarities Assofond (Italian Foundry Association) has carried out a work of data collection and data processing to identify:

- energy benchmarks;
- areas in which efficiency interventions are possible.

This methodology can be found in a document named «Guidelines for the development of an Energy Audit in the Foundry sector according to the art. 8 of Legislative Decree 102/2014“ (click here).

What we know from the energy audits

The energy benchmarks were identified for homogeneous groups of companies characterized by homogeneous technical-production structures on:

- the melting systems (cupola furnaces, electric furnaces, gas furnaces);
- the moulding systems ("green" molding for series production, sand/resin molding for production of single pieces or limited series).

The analysis of the data showed that the consumptions of companies are concentrated:

- in the casting and moulding phases (main activities) - about 65% of the total;
- in the production of compressed air and on the extraction/purification systems (auxiliary services to production) - about 15% of the total.

Rationalization interventions carried out in the Italian foundries

After the audits carried out by 2014, a series of "savings“ of electricity energy have been identified which correspond to the annual consumption of 22,880 typical households [source of reference data: ARERA (Regulatory Authority for Energy, Networks and the Environment)].

Total number of energy efficiency measures identified	226
Total potential investments in euros (€)	28,463,320
Total potential savings euros (€)	9,318,824
Total potential savings TOEs	12,431
Total potential electrical savings MWh	61,777
Total potential thermal savings MWh	11,166
Average Payback Period (PBP) in years	4,51

PayBack Period (years)	Number of interventions	TOE saved per year	Euros saved per year (€)	Investments (€)
1	33	1,266	2,042,540	667,024
2	67	2,063	2,602,355	1,617,153
3	97	4,603	4,045,035	5,042,970
5	166	10,167	7,878,225	18,670,922
10	218	12,382	9,291,664	27,538,354
Total	226	12,431	9,318,824	25,463,320

Many thanks for the attention