



Industry

# Project Profile

## Elkem Carbon

a Bluestar Company



### The EMIL award 2014 to Elkem Carbon Fiskaa



Technical director and energy manager Harald Jakobsen from Elkem Carbon Fiskaa (left) received this year's EMIL award from the Norwegian Energy adm. Dir. Jon Tveit under Norwegian Energy's annual meeting at OS Louise at Aker Brygge in Oslo.  
Photo: Anne Evensen, Norwegian Energy

This year's EMIL award, which was presented during Norsk Energi's annual meeting on June 12th, went to Elkem Carbon Fiskaa. They were awarded the prize for their commitment to introduce energy management and their will to implement good measures for energy saving.

The energy and environment award – the EMIL award – from the NGO Norsk Energi was presented for the 31st time this year. The award is presented to a company, person or institution which is able to present positive measures related to energy or environment by exploitation, conversion, recovering or saving of energy among the organization's principals or members.

Elkem Carbon has, as the first company within the Elkem Group, established energy management in accordance with the international ISO 50001 standard, and has, this far, determined a goal to reduce the specific energy consumption by 35 per cent within December 31st 2016.



Elkem Alcoa, Fiskaa außerhalb Kristiansand in Norwegen

The energy saving equals 34 GWh/year of electric energy. Both the management and the employees have shown great commitment, but the technical manager and energy manager Harald Jakobsen has been an important enthusiast and driving force in the work.

In order to facilitate continuous measuring of the energy performance and the effect of the measures that have been introduced, 42 new energy meters and an Internet based energy management system from Cebyc – Energinet, have been installed.

The Group management has decided that all of Elkem's facilities in Norway will establish energy management, and Elkem Carbon will therefore be a good example for the other companies in the Group. Through systematic and goal oriented work, Elkem Carbon has uncovered great energy saving potentials. Several measures have already been implemented with success, whereas other measures are planned implemented with investment support from Enova.

It is heat recovery from the calcining kilns where coke and anthracite are heat-treated at about 2000 °C which constitutes the greatest energy saving potential. Currently, volatile gases from the calcination process are burned in a flare burner over the roof. Previous attempts at recovering the energy from these hot gases have failed because of problems related to fouling and corrosion.

Norsk Energi believes that they have a solution to the problem. There are a few challenges related to handling process variations and ash/sulphur in the flue gases which one wants to have tested before moving on to full-scale development. If one succeeds with the test runs, the flue gas from the combustion will be exploited in a heater for heating hot oil. Hot oil at about 300°C is used for heating the process facility for pitch and electrode mass.



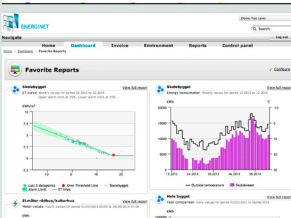
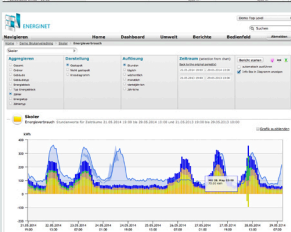
Energinet is developed and maintained by:

[www.cebyc.com](http://www.cebyc.com)



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Currently, a lot of electric energy (6.2 GWh/year) is used for this process. An equally important effect by burning the exhausts in a controlled manner in a heater is that one will be able to clean the sulphur from the flue. This will be the next step of this project in which one will be able to remove up to 99 per cent of the sulphur emissions from the calcination plant. The energy management project has also mapped several other areas of use where waste heat may be exploited for heating or drying processes. Thus the requirement for electrical heating at Elkem Carbon or other companies in the same industrial area is reduced. Elkem Solar and Elkem Technology are neighbouring companies within the same Group which may exploit the waste heat for various heating purposes.

## Process flow for the production of electrode mass.

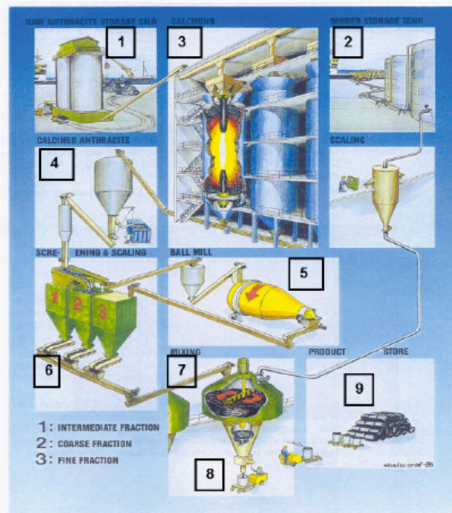
### Process flow Elkem Carbon

Electrode mass consists of two main components:

- Electrically calcinated anthracite
- Binding agent coal tar pitch.

### Process stages:

1. Raw material storage and supply system for raw anthracite.
2. Raw material storage and supply system: Liquid coal tar pitch.
3. Electrical calcination process (heat-treatment) for converting raw anthracite to electro calcinated anthracite; up to 2500 °C.
4. Buffering of Electro Calcinated Anthracite (ECA).
5. Crushing and milling of the ECA.
6. Grading and weighing of ECA for every batch of electrode mass.
7. Batch blending of the electrode mass. The ECA and the binding agent are mixed in a mixer.
8. Casting: The electrode mass is filled into steel moulds of various formats.
9. Cooling: The electrode mass is cooled with water (spray) and air (natural convection).



### About Elkem Carbon

Elkem Carbon is the world's largest manufacturer of electrically calcinated anthracite and electrode mass, and has as its vision to be among the world's leading companies within environmentally sound production. Electrically calcinated anthracite and electrode mass are necessary in the production process for steel, aluminium, silica and other metals. At Elkem Carbon Fiskaa in Kristiansand, coke and anthracite are heat processed at about 2000°C in twelve calcination ovens which each has an electric power of about 1MW.

The heat processing makes the anthracite into an electrically conductive, clean and stable material so that it may be used as electrodes in ovens and electrolysis cells for the production of metals.

The annual energy consumption in the production plant is about 105 GWh electrical energy. Elkem Carbon Fiskaa has around the clock production and 69 employees.



Source: Norsk Energi, Oslo

