

# **CLEAN ENERGY AND INDUSTRIAL COMPETITIVENESS FOR SUSTAINABLE DEVELOPMENT**

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Sofia 1784, Bulgaria  
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## **Investments in energy-efficiency and reduction of CO2 footprint in Solvay Sodi**

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20 ГОДИНИ  
СОЛВЕЙ В БЪЛГАРИЯ



SOLVAY SODI





## Solvay Sodi is part of the Solvay Group

Ernest Solvay founded Solvay in 1863, based on a technological breakthrough; Today Solvay is an:

***International chemical group with headquarters in Brussels, represented in 61 countries, which employs over 25,000 worldwide;***

- A global leader in the production of chemical products.
- 21 global centers of research and innovation.
- The group has a total of 7 soda ash plants (6 in Europe, one in the US) and is the world number ONE producer of soda ash and sodium bicarbonate.



# Soda Ash Production in Bulgaria

- **29/08/1954:** Commissioning of the first soda ash plant in Devnya with a capacity of 80 000 tonnes
- **31/12/1973:** Commissioning of the new soda ash plant; Expansion of capacity to 1.2 Mt/y
- **14/04/1997:** The Government of Bulgaria and SOLVAY sign Privatisation contract of Sodi, Devnya. Major shareholders in Solvay Sodi: SOLVAY (~ 75%) and SISECAM (~ 25%)



**2000:** Solvay Sodi acquires suppliers of basic raw materials for soda ash production: TPP Solvay Sodi, Provadsol, Devnya Limestone



- ✓ With a capacity of 1.5 Mt/y., Solvay Sodi is the **largest site in Europe** and within the Solvay Group for the production of synthetic soda ash.
- ✓ Direct employer of 600 people and indirectly more than 1,000 in subcontractors. Safety is **No 1 priority** (as within the Group)
- ✓ During the period 1997-2017 Solvay Sodi and affiliates have invested over **1.5 billion BGN** in the construction of new / upgrading of existing installations
- ✓ Investments achieved optimization of the use of natural resources, higher energy efficiency, reduction of emissions and others.
- ✓ Of 12.09.2017 another **large-scale investment** was inaugurated: a new state-of-the-art circulating fluidized bed boiler



## 3 big projects

- **CFBB1** - 67,8 MEUR  
Investment, in operation since  
2009
- **DSV** - 24,7 MEUR Investment, in  
operation since 2015
- **CFBB2** - 43,4 MEUR  
Investment, in operation since  
2016



## CFBB at Solvay Sodi power plant Technology with low emissions rates

- Main target**

Satisfy the greater demand of heat energy of the customers at Devnya industrial site by guarantying full compliance with the emission limit values defined by the IPPC:

<b>NO<sub>x</sub></b>	<b>1 200 mg/Nm<sup>3</sup></b>
<b>CO</b>	<b>1 000 mg/Nm<sup>3</sup></b>
<b>SO<sub>2</sub></b>	<b>400 mg/Nm<sup>3</sup></b>
<b>total dust</b>	<b>50 mg/Nm<sup>3</sup></b>

**Individual emissions limit values – 2017**

<b>Parameter</b>	<b>Common stack (Boilers 2, 3 and 6)</b>	<b>CFBB 1</b>	<b>CFBB 2</b>
Sulfur dioxide	< 800	< 200	< 200
Nitrogen oxides	< 1200	< 200	< 150
Total dust	< 100	< 20	< 10
Carbon oxide	< 100	< 100	< 100
Ammonia	-	< 5	< 5

# CFBB at Solvay Sodi power plant

## Technology with low emissions rates

- **CFBB advantages**

- High efficiency rate
- Smaller construction dimensions
- Flexibility for different types of fuels
- Combustion of worse-quality fuels
- Combustion of wastes
- Low emissions of  $\text{SO}_2$  and  $\text{NO}_x$
- Less corrosion of the construction
- Easier separation of slag and ashes
- Low air excess
- High reliability
- Lower maintenance costs





## • Advantages of the vacuum distillation installation

- total capacity 1000t. soda / day
- utilization of waste heat (steam): 67 t / hour
- significant reduction of the steam consumption
- lower solid fuel use
- reduction of CO2 emissions



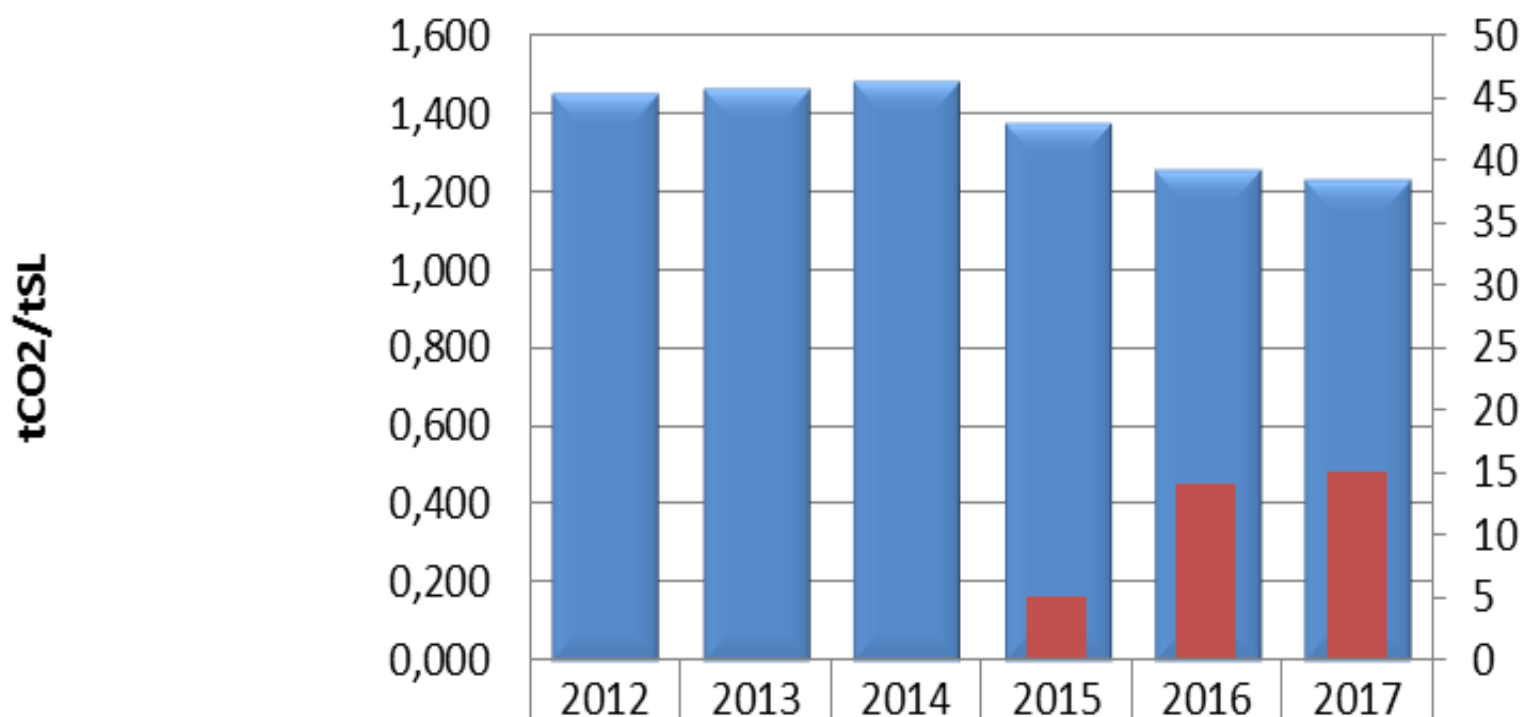
## Highlights

- **CFBB 1 and 2**
  - Total capacity - 485 MW
  - **Circulated Fluidized Bed Boiler** - new technology
    - Possibility to use different fuels - coal, biomass, RDF, etc.
  
- **DSV**
  - Capacity - 1 000 tSL/d
  - Distillation under vacuum
    - Possibility to recuperate low pressure steam released before in the atmosphere

## Lowlights

- Lack of biomass and RDF on the market

# CO2 emissions reduction



■ CO2 emissions, tCO2/tSL	1,449	1,463	1,482	1,375	1,254	1,227
■ Emission reduction, %				5	14	15

# Thank you!



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