

# IMPACT OF ETS FOR INDUSTRY

Tomaž Vuk, Salanit Anhovo cement plant, Slovenia Sarajevo 8th September 2016

# Salonit Anhovo is a leading cement producer in Slovenia

- Production capacity: 3200 tons of clinker per day (1Mt/y)
- 50 % cement market share in Slovenia
- 50 % of production is exported

Salonit Anhovo is a Wietersdorfer group member



# 15 YEARS OF SYSTEMATIC TECHNOLOGICAL IMPROVEMENTS

## NOISE REDUCTION

- Modernization of cement grinding plant
- New grate clinker cooler

## DUST REDUCTION

- New covered storage hall for raw materials and fuels
- Exchange of electrostatic filters with modern bag filters

## KILN SYSTEM MODERNISATION

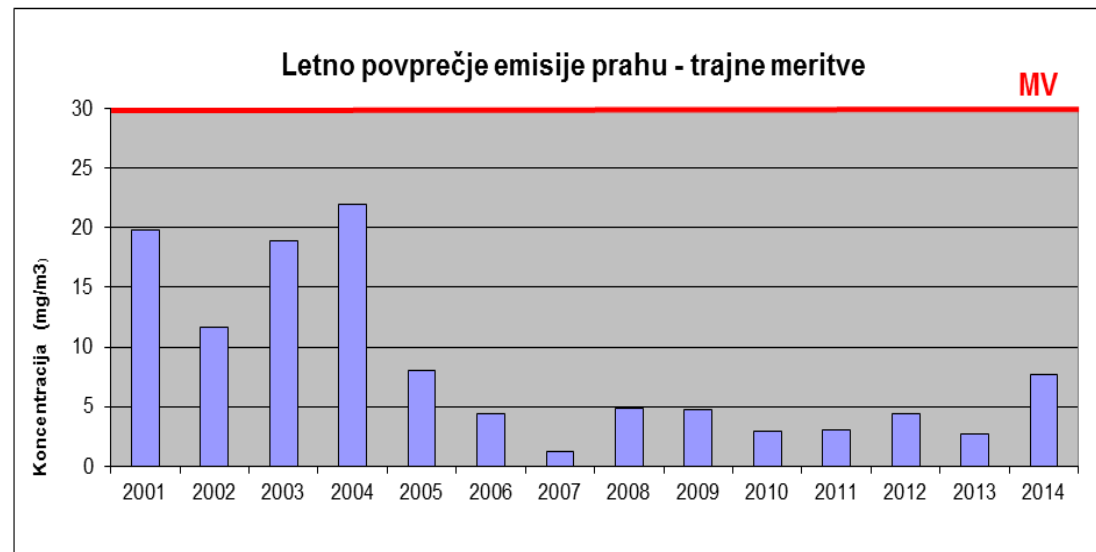
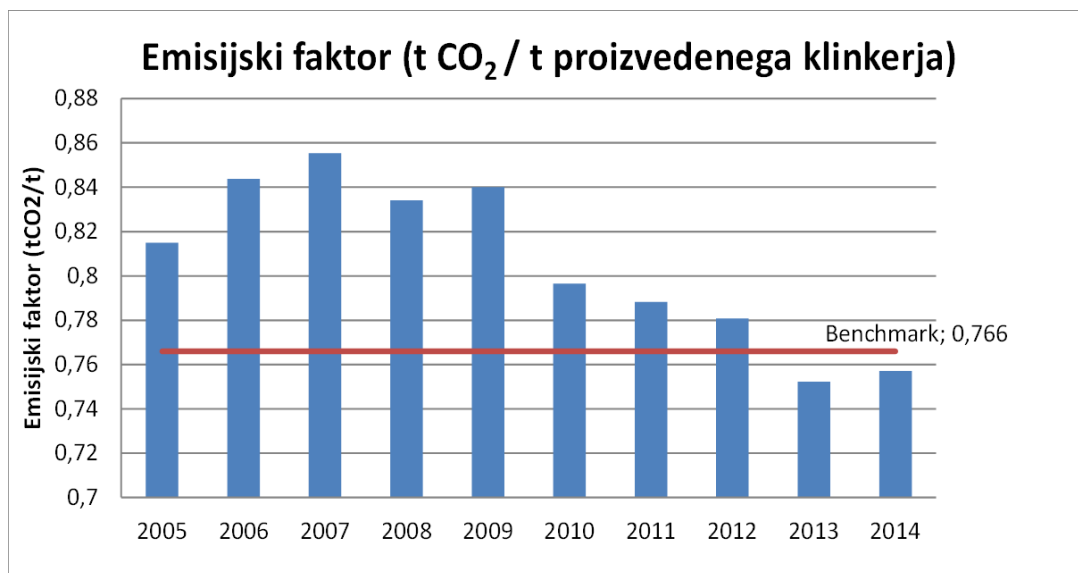
- New preheater
- Systems for alternative fuels dosing

## PLANNED INVESTMENTS IN 2015

- System for dosing 3D fuels in the kiln
- System for chlorine removal (by-pass)



During last 15 years Salanit Anhovo has increased production capacity and at the same time improved its environmental impact. Now is one of the most modern plant in the region. Salanit Anhovo significantly improved energy efficiency and specific emissions of CO<sub>2</sub> with deliberately planned modernisation of production line and development in the field of fuels and products.



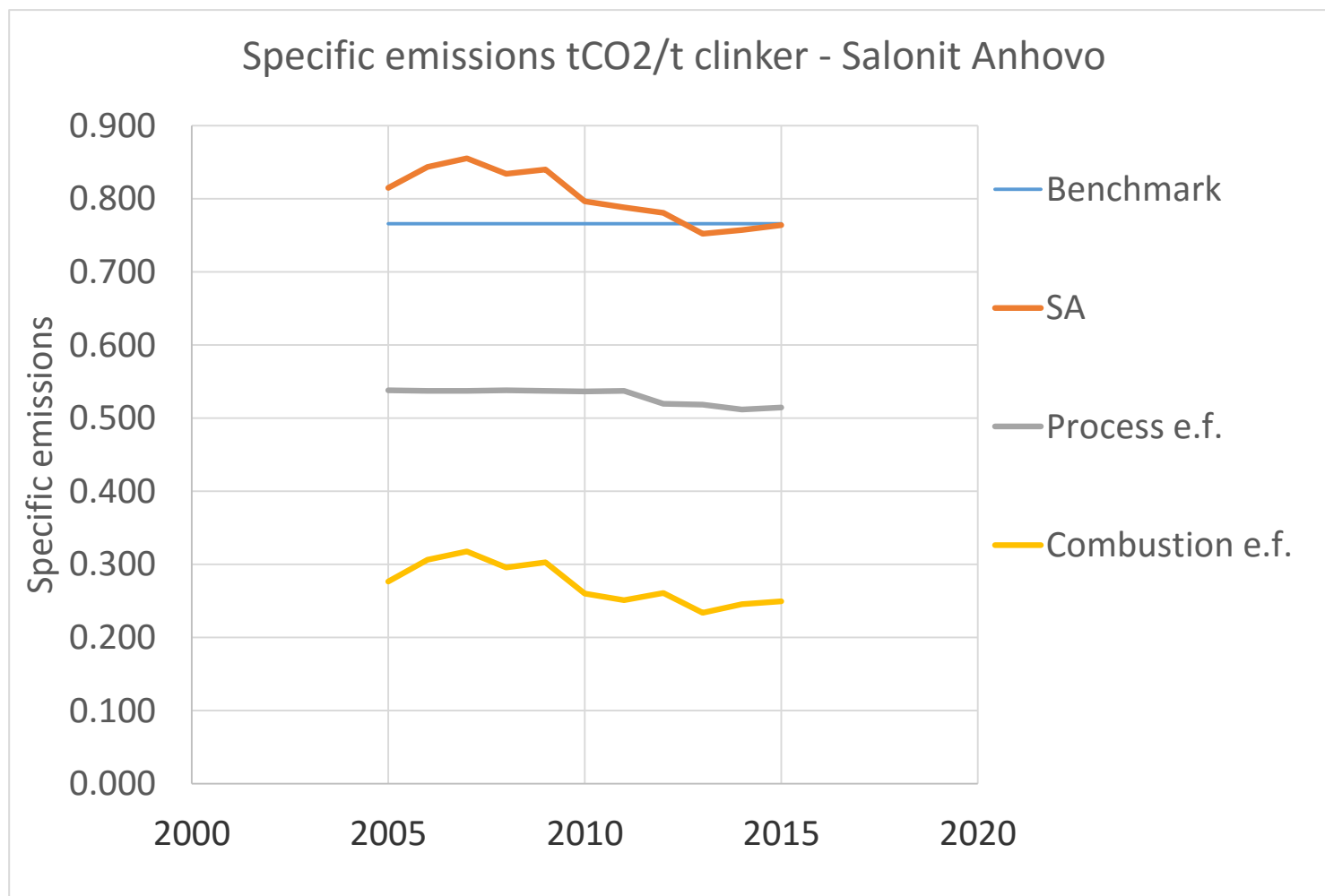
ETS is a complex problem for cement industry with implications on operations and costs, competitiveness, monitoring and reporting, permitting process, company and industry strategy. Uncertainty about future ETS rules does not make things easier.

- Complexity of monitoring process and its scope
- How to secure appropriate allocation with installation of new capacities (Assuring appropriate allocation is a complex, uneasy process. Constant changes of the ETS system create uncertain business environment that does not encourage investment in new technology)
- Mitigation of future emissions constrains
- Implication on competitiveness
- Implications on company strategy

## Cement production has 2 sources of CO<sub>2</sub> emissions:

- Process emissions from thermal decomposition of limestone (raw materials)
- Emissions from fuel combustions

Potential for minimizing process emissions is very limited. Process emissions represent 2/3 of all emissions.



Salanit Anhovo has decreased its product emissions below benchmark value. It is a result of improved energy efficiency of production and changed fuel mix with high biogenic carbon content.

# MONITORING: PROCESS EMISSIONS

- Emission (t CO<sub>2</sub>/year) = activity (t clinker/year) \* emission factor (t CO<sub>2</sub>/t clinker) \* conversion factor
- Emission factor (t CO<sub>2</sub>/t clinker) = 0,785\*Ca(CO<sub>3</sub>) content + 1,092 \* Mg(CO<sub>3</sub>)content (analysis of CaO and MgO content in clinker)
- Conversion factor: - equal 1 (all CaO and MgO as carbonates)  
- determination of parameters should be based on analyzes (TGA)

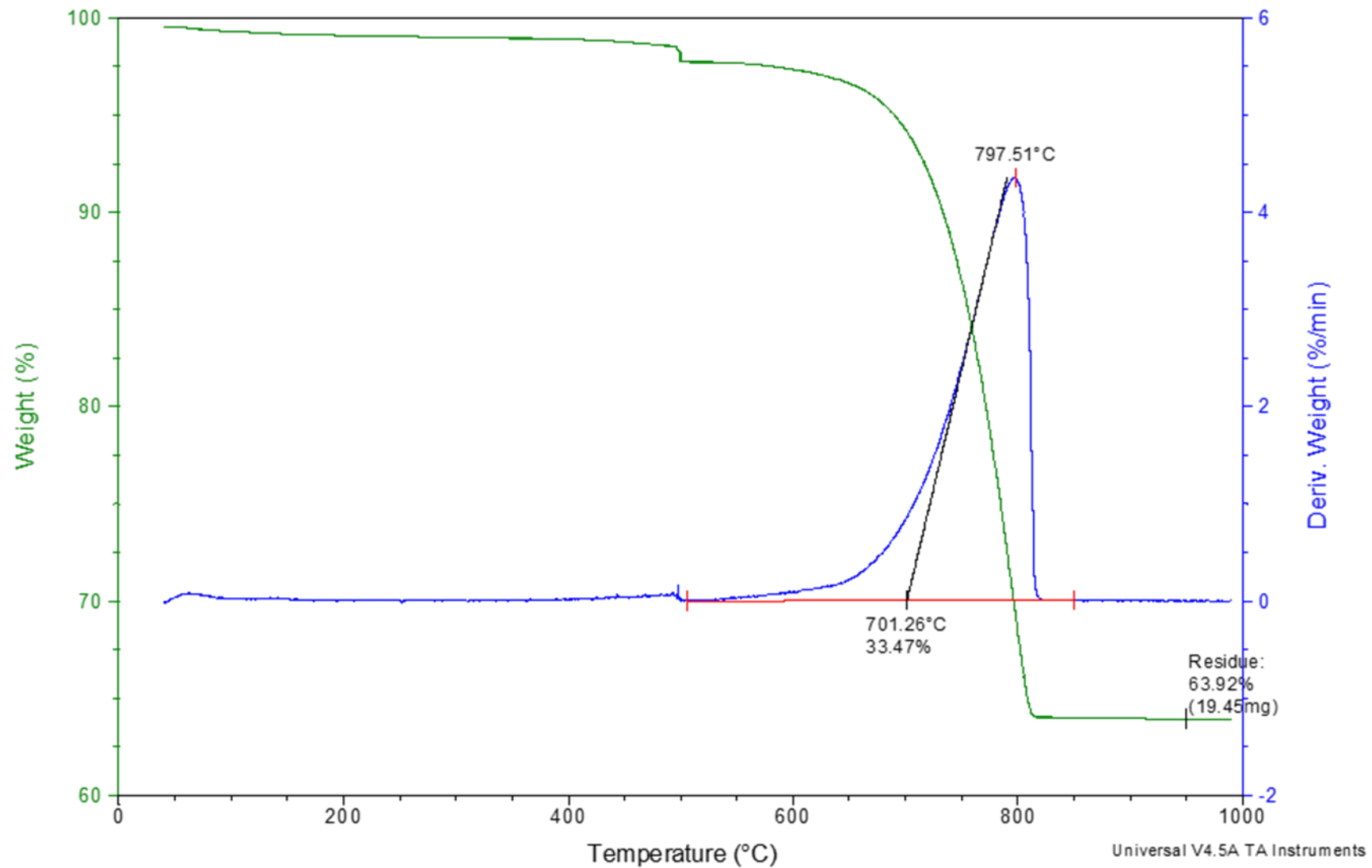
# TGA DETERMINATION OF PROCESS EMISSIONS

- TGA was already used in Salanit Anhovo for monitoring the properties of clinker. The parallel analysis of CO<sub>2</sub> emissions from raw meal were made with Kemijski inštitut Boris Kidrič in Ljubljana. We have to accredit the method before the competent authority let us implement it.
- TGA enable us to determine direct emissions from the raw material and then calculate the emission and conversion factors.

Sample: LM\_TP\_24/16  
Size: 30.4234 mg  
Method: 10-500-1000-LM  
Comment: 25.7.-31.7.16

## TGA-DTA

File: \\...DTAMOKA 2016\LM\_TP\_24\_16.001  
Operator: MM  
Run Date: 02-Aug-2016 07:10  
Instrument: 2960 SDT V3.0F



Complex monitoring system of fuel related CO2 emissions had been set up.  
Complexity is related to fuel structure and determination of biogenic carbon content.

FUEL	NET CALORIC VALUE MJ/kg	EMISSION FACTOR t CO2/TJ	CARBON SHARE %	BIOGENIC CARBON %
Natural gass	NE	NE		
Diessel	NE	NE		
Coal	SA		AL	
Petrol coke	SA		AL	
waste tires	NE	NE		AL
waste oil	SA		AL	
SRF	SA		AL	AL
sludge	NE	NE		
animal meal	NE	NE		

NE ... national evidence

SA... Salonit Anhovo laboratoriy (acreditation)

AL...accredited external laboratoriy

150 samples are composed from regular sampling of raw material and fuel deliveries. Analysis of these samples are used in emissions calculation and reporting.

	No. of deliveries/ sampling frequency	CaO, MgO	TGA	ashes	NKV	C	biogenic C
Raw meal	1 per hour of production		41				
Clinker	1 per hour of production	41					
Coal		Up to 6 analyses, depends of the quantity					
Petrol coke	30			6	6	6	
waste tires	2500						8
waste oil	85	Up to 4 analyses, depends of the quantity			2	2	
SRF	1500			7	7	7	7
sludge	230			27			
animal meal	95			12			

More than 1000 engineer hours and more than 500 laboratory worker hours are needed to execute yearly monitoring activities. External costs related to analysis, quality assurance and verification activities are around 20000 EUR.

	ENGINEERS working hours/year	Laboratory workers working hours/year	EXTERNAL COSTS EUR
Legislative and guidelines changes	24-100		
GHG emission permit	0-80		
Monitoring plan	20-140		
Monitoring (sampling, analyses)	32	334	6300
Quality assurance and quality control	600	200	7500
Annual emissions report	120		
Verification	16		6800
Annual improvements report	16		

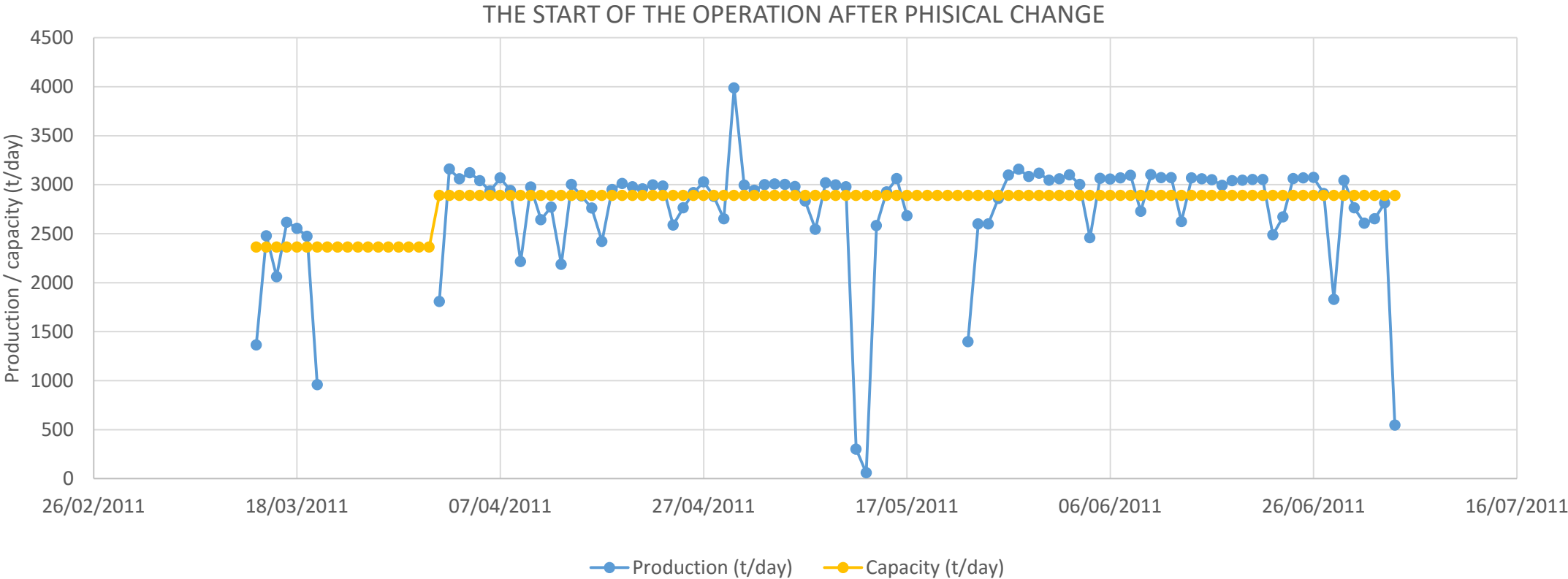
Only laborants working hours and external costs which are spent exclusively for CO2 monitoring  
Costs and hours for regular analyzes are not included

Assuring appropriate allocation is a complex, uneasy process. Constant changes of the ETS system create uncertain business environment that does not encourage investment in new technology and create many other problems.

- 2005 - 2008: National allocation plans. Emissions allocation is based on the highest annual emissions of the years 1999 to 2002, effect of Benchmark compliance is 5 % and demand for lower emissions according to the Kyoto target. Process emissions are allocated 100%. Max. no. of coupons that are allocated for one new entrance is 13.333 coupons/year.
- 2009 – 2012: National allocation plans. Emissions allocation is based on average annual emissions of the years 2002-2005 (process emissions are allocated 100%, 30 % of combustion emissions are determined according to Benchmark; correction factor for adjusting to the Kyoto targets. Max. no. of coupons that are allocated for one new entrance is 14.000 coupons/year.
- 2013 – 2020: The allocation is carried out by EC by sectors (carbon leakage). The base is HAL (historical activity level), the average of two highest monthly productions in years 2005 do 2008 taking into account the Benchmark factor. Special roles for approving of the new entrances. CSCF decreases the allocation for 1.78% per year.
- 2021 – 2030: The rules have not yet been determined. It is anticipated even steeper decline on an annual basis (2.2%) and real-time adaptation of Benchmark factor to new technologies...

## Increased capacity of production is entitled to additional allocation from reserve for new entrants.

New capacity should be placed in service. New added capacity is confirmed in the process of determining the start of the normal operation. The added designed capacity should be used at least for 90 days in the amount of 40 %. The new capacity which is the average of the highest two months production in 6 months after the start of the operation should be at least 10 % higher than previous capacity.



ETS has an impact on company competitiveness. How big this impact will be in next decades depends on ETS rules in the future. ETS should be developed in the light of global environment.

- During the first period of ETS allocation was made on national level with different approaches of member states. That created unfair competition between industries from different countries in EU.
- Free allocation in some cases artificially improve competitiveness of bad performers slowing down a move of production on best performers.
- Additional CO2 costs make EU production less competitive towards others. Carbon leakage is a serious threat.

# The need for combating climate changes and ETS are opening many difficult strategic questions for EU industry.

- Salanit has reached the existing state of the art technology and CO2 performance. There is not much room for improvement in CO2 emissions with the existing knowledge. How to assure future production with the required profitability is a major strategic question.
- What will future ETS rules bring us?
- Will other world follow EU approach?