

NON-TECHNICAL SUMMARY

(Second Float Line in Trakya Glass Bulgaria EAD)

1. INTRODUCTION

ŞİŞECAM GROUP

Şişecam Group is an industrial group with the main activity fields of glass and chemicals production. The group is in a leading position in business lines covering all basic fields of glass such as float glass, glass household articles, glass packaging and glass fiber as well as soda and chromium compounds.

ENVIRONMENT

Şişecam Group has always considered the environmental awareness and performance as an important responsibility, based on the significance of the approach of sustainable development. In this respect, environmental compliance at national and international levels, as well as the reduction and assessment of environmental impacts are taken into consideration during the decision taking and production processes.

In Şişecam and its subsidiary companies, all environmental issues are handled within the framework of Şişecam's Environmental Policy, declared as:

“Şişecam, as an organization strongly aware of its responsibility towards the protection of environment, believes in the need to maintain the world as a livable place for coming generations.

This approach is considered as the cornerstone of Şişecam's strategic management and is integrated in every phase of its work processes.

Our aim is to carry out all environmental protection activities in Şişecam within a framework of an environmental management system by taking account the sustainability principles and continuously improve the system with the support of all our employees and stakeholders”

OCCUPATIONAL HEALTH AND SAFETY

As a result of the importance it places on and the respect it pays to humanly working and living right, Şişecam projects formation of a mentally and physically healthy community and workforce through realizing all its activities in healthy and safe working environments, and believes that this is the surety of its future. Setting out from this belief which is a fundamental and indispensable item of its management understanding, Şişecam, through implementing the legal legislation, standards and contemporary management systems, targets to continuously improve

the working environment and conditions in line with the technological changes and developments, to inform its employees and all parties it is in relation with, and so to contribute to establishment of a real 'health and safety culture' in all segments of the community.

“ŞİŞECAM places great emphasis and considers the right of life and labor in humane conditions. It envisages the establishment of stable in spirit and body society and labor force as for that purpose requires all activities to be executed under safe and healthy work conditions and believes that this way the safe future will be reached.

Believing that this idea represents an integral and basic part of the management thinking ŞİŞECAM constantly improves the conditions of labor environment by applying statutory provision, technologic reaches, standards and modern management systems. Submitted information to its employees and to everybody it has relations with it aims to contribute to the formation of health and safety culture in every one layer of society.”

Flat Glass Group

Carrying out the activities of SiseCam Group in the field of flat glass, Trakya Cam is the leading company of the flat glass market in Turkey and the pioneer in the region.

Trakya Cam that employs the latest technologies in production, operates in the fields of;

- basic glass (flat glass, patterned glass, mirror, laminated glass, coated glass, glass for architectural applications),
- automotive glass and glass for other vehicles,
- energy glass,
- glass for home appliances

and provides input for various sectors including construction, automotive, energy, home appliances, furniture and agriculture.

Trakya Cam is the first company to deploy the "float technology" among the East European, Balkan, Middle Eastern and North African countries with its first float line that became operational in 1981. Trakya Cam has pioneered the development of the flat glass industry in Turkey and in the region with its investments of float glass, automotive glass, processed glasses and through its wide range of product portfolio.

In accordance with its vision of leadership in the region and its strategy of multi-focus production, Trakya Cam inaugurated the first float line of the Balkan Region in 2006 under the identity of Trakya Glass Bulgaria EAD, which is the subsidiary of Trakya Cam and the plants of mirror and tempered glass successively. Trakya Cam opened its automotive glass plant in 2010,

where it plans to make production for the Balkan and European markets.

2. THE NEW PROJECT

2.1. OVERVIEW

Trakya Cam will operate a new float line in Trakya Glass Bulgaria EAD Plant. The investment project will be fully integrated with technical infrastructure of existing Float Glass Line.

Second Float Glass Line investment will be with capacity of 740 t/d and 225 000 t/y. For providing of whole production cycle of the installation will be used hydrogen installation, nitrogen installation, compressing station, installation for water softening related to cooling installation, diesel generator (foreseen for emergency cases) and steam boiler – in stand-by.

2.2. SITE LOCATION

The project of second float glass line will be located in “Trakya Glass Bulgaria” EAD which is positioned in Industrial Area of town of Targovishte, in eastern Bulgaria. The town of Targovishte is located about 350 km east of Sofia, about 130 km west of the major Black Sea port of Varna, about 150 km south of Bulgarian- Romanian border and about 250 km from the Bulgarian – Turkish border (See Figure 1)

2.3. PRODUCTION CAPACITY AND PRODUCT

The modern “float” production technology will be implemented for second Float Glass Furnace, which guarantees perfectly smooth surface of the glass and 100% transparency of the products. The daily capacity of the second float glass plant will be 740 tons of flat glass, and annually the factory will produced 225,000 tons flat glass from 1.6 to 12 mm in thickness and various colors.

2.4. PRODUCTION TECHNOLOGY/TECHNOLOGIES

Flat glass is a high technology product which meets the different requirements of various industries, mainly the construction and automotive sectors. The product range comprises of clear and colored flat glass in various thicknesses. In addition to construction and automotive; furniture, home appliances and agriculture are the other industries supplied. Flat glass is also used in the energy sector, particularly in solar collectors and in power generating solar cells.

With the growing awareness of energy conservation and environmental protection, flat glass is gaining much more importance for its contribution to energy efficiency in buildings.

The Flat Glass products will be produced by the modern “float” production technology which in fully compliance with Reference Document on Best Available Techniques in the Glass Manufacturing Industry.

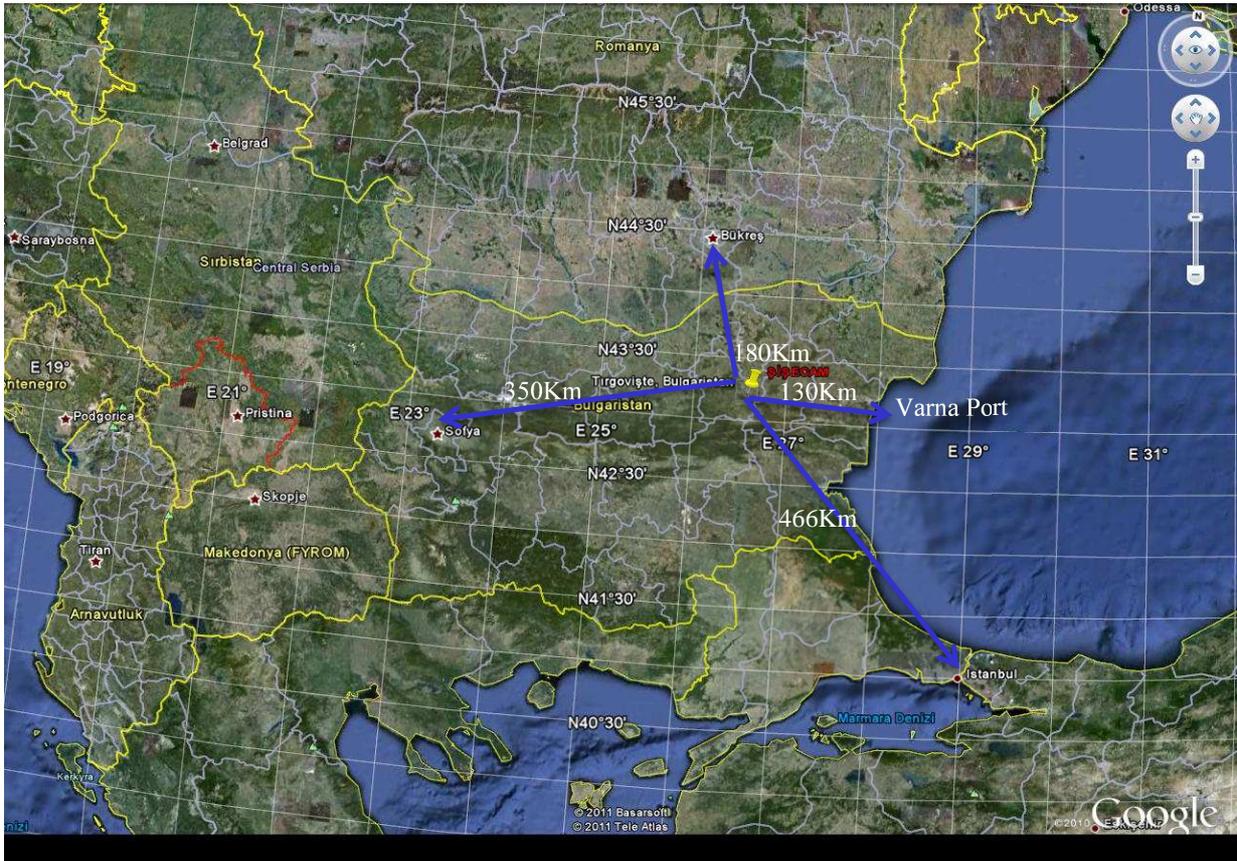


Fig.1 Site location of Trakya Glass Bulgaria EAD

2.5. KEY BENEFITS OF THE PROEJCT

There has been a need to put a second float furnace into operation in Bulgaria in order to sustain the current strong position in the European Market due to its close proximity to the market by taking into account the production location opportunities within the regional procurement strategy of our group.

Also the second float line target will be the raw glass supplying for the Automotive Glass Plant Bulgaria, Coated Glass Plant Bulgaria, and Laminated Glass Plant Bulgaria. There is existing automotive glass plant in Sisecam Bulgaria area and with the second float glass line the capacity of automotive glass plant will be increased and all raw glass needs will be supply from second float line.

In the existing situation coated glass line and laminated glass line requirements of European market is supplied by Turkey plants. But to be not closed enough to the market and in the

context of competition by considering the freight and transportation issues is giving negative effects in the market.

Because of this with the second float line Sisecam will have coated glass and laminated glass lines investments and the European market needs for coated glass and laminated glass will be supplied directly from Bulgarian plants. Raw glass needed for coated glass and laminated glass lines production will be supplied from Second Float Glass line. Hereby this will be created a big synergy.

The first item for the profitability in the Promotion sector so as to become an active player by way of “Bulk” production is the low cost. With the current cost structure at the Bulgarian plant and this investment planned, the production lines which will be brought into service will empower our Group in the competition for the Promotion sector.

The bringing into service and reaching a certain performance process is one of the key elements in the investments’ reaching to success. The current production and management skill will make a positive contribution to the production costs by an efficient use of second float line investment.

3. ENVIRONMENTAL OBJECTIVES OF THE PROJECT

3.1. EMS and OHSAS Integration and systems in place

Existing float glass line has fully implemented Integrated Management System which includes Environmental Management System, Health and Safety Management System and Quality Management System.

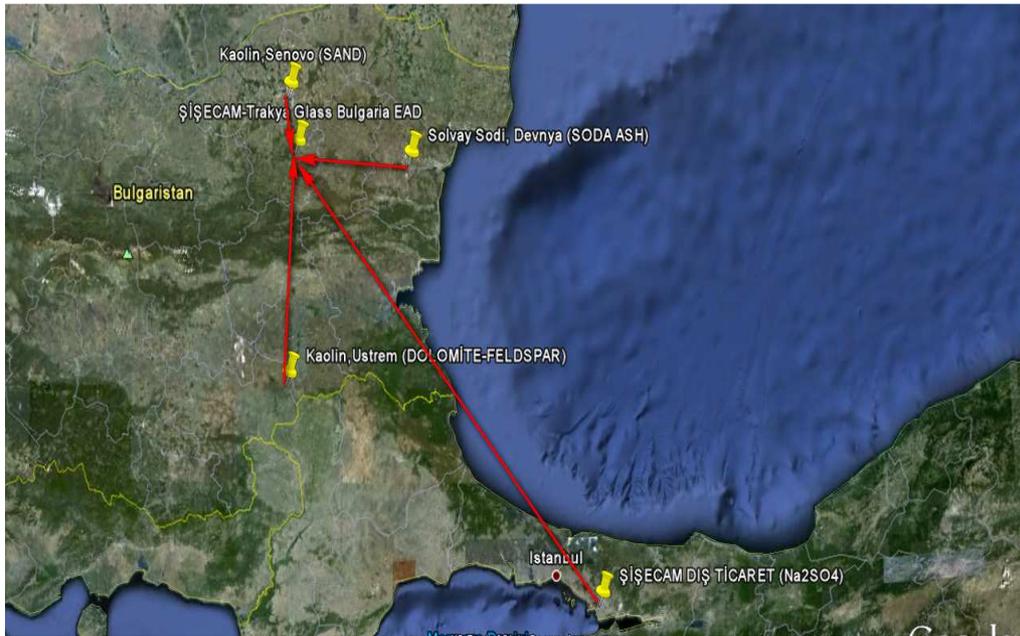
After realization of the project for second Float Glass Line this management systems will be applied for new plant too.

3.2. Resources (N/G, electricity, water, raw materials)

For the second Float Glass Furnace, main resources are natural gas, electricity, water, raw materials – sand, lime stone, soda ash, sodium sulphate and feldspar.

Natural gas will be supplied from Bulgargas which is unique supplier in Bulgaria. Industrial water and domestic water will be supplied from national water company named “ViK” OOD city Targovishte. The other process gases will be supplied from different companies like Linde, AirLiquide, LukOil. Electricity will be supplied from free market by yearly contract. Currently CEZ Company was chosen for 2012.

Sand, will be supplied from Kaolin-Ruse Mining Facility, which is 100 km. far away from the plant. Limestone will be supplied from Kaolin-Varna, which is 100 km. far away from the plant. Soda ash is planned to be supplied from Sodi-Devniya, which is a subsidiary of Sisecam Chemicals Group in Bulgaria. Sodium Sulphate will be supplied from Camis Madencilik-Istanbul. Feldspar will be supplied from Kaolin-Ustrem, which is 320 km far away from the plant.



3.3. Emissions: Air, water, nonhazardous and hazardous wastes

Planned environmental measures:

- As a primary measure; Low-NO_x burners will be used to reduce NO_x emission that is generated mainly due to the natural gas firing process used in the glass melting furnaces of both production lines.
- As a secondary measure; In order to reduce NO_x and dust emissions from second Float Glass Furnace, waste gases will be connected to the new waste gas treatment system composed of ESP and SCR.

Expected amount of air emissions of NO_x, SO_x and dust from second float furnace only are given below:

Parameter	tons/ year *	mg/ Nm ³
NO _x	321	< 500
SO _x	513	< 800
Dust	12.8	< 20

*All the values are calculated on the base of maximum emission levels and maximum debit of waste gases.

Sanitary wastewater that will be generated from the various activities in the Plant will be discharged in the sewage without treatment since the sewage is connected to city Waste Water Treatment Plant (WWTP).

Process wastewater that will be generated from various production activities in the Plant are blow-down from the boilers, blow-down from the cooling water system and wastewater from the regeneration of softener resins. These waters will be discharged to the water body without treatment since discharges satisfy the limits.

Nonhazardous wastes that will be generated from second Float Glass Line will be mostly paper, plastic, metal, wooden packages and glass cullet. Wastes of paper, plastic, metal, wooden packages will be stored separately and will be given to authorized recycling companies. The cullet will be recycled in the Float Glass furnace.

Hazardous wastes that will be generated from second Float Glass Furnace will be mostly waste oil, waste accumulators, empty packages of hazardous materials and waste fluorescent lamps.

Waste generated from second Float Glass Furnace will be managed according to the requirements of IPPC permit and Waste Management Program approved by relevant authorities. Wastes will be collected separately and will be storage in a waste storage area. Waste disposal will be realized only with authorized companies.

In order proper waste collection and separation additional waste storage area will be constructed.

3.4. Noise at boundary

There will be no noise impact at the boundary. However, noise at the boundary and at a point that the nearest house can be effected will be monitored according to the legislation requirements by authorized laboratories and data of monitoring will be reported to relevant authorities.

3.5. Energy efficiency & carbon management (including carbon emissions and any reduction measures)

Rules of ETS according to Kyoto Protocol are applicable for "Trakya Glass Bulgaria" EAD. Emissions of CO₂ from the plant are calculated according to the Monitoring plant approved by Bulgarian Environmental Executive Agency and are verified and reported annually to the relevant authorities.

Main techniques for reducing energy usage are listed below together with their application in the second Float Glass Production Line.

- ⇒ **Furnace design:** In second Float Glass Line, the furnace is designed as regenerative furnace, by which heat of the flue gas is recovered and used for the pre-heating of the combustion air. This design will provide saving of fuel usage and CO₂ emissions generation.
- ⇒ **Combustion control and fuel choice:** For the most efficient combustion, all combustion parameters will be monitored and evaluated continuously. As well as that low-NO_x burners will be utilized.
- ⇒ **Cullet usage:** Internal cullet recycling, which provides substantial savings from raw material, energy and CO₂ emissions generation, will be a part of the production for both lines.
- ⇒ **Waste heat boiler:** Waste heat boiler will exist at each line before the flue gases are emitted via the stacks. By the help of these boilers, it will be possible to recover some more energy from the flue gas and use it for heating purposes. It will provide saving of fuel usage and CO₂ emissions generation.

After second Float Glass line starts to operate in compliance with Bulgarian legislation, audit for energy efficiency observing will be completed by an authorized auditing company which is certified by Sustainable Energy Development Agency. According to results of audit, measures for improvement of the energy efficiency will be listed and action plan will be provided.

KEY CONTACT for the site

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