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GLASS PERFORMANCE DAYS 2017

JUNE 28 - 30, 2017. TAMPERE, FINLAND

GPD 25 YEARS


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25
YEARS

RUSSIAN FLAT GLASS COATINGS MARKET OVERVIEW

Dmitriy D. Bernt
Glass Coating Technology
Pilkington Glass Russia&CIS

Pilkington Glass in Russia

Architectural flat glass float line in operation since 2006 in Ramensky District Moscow region

2012: off-line glass coating operations “greenfield” startup

In 2014 architectural glass coating line with magnetron sputtering PVD installation VonArdenne GC330H has been brought to operation

September 2016: record of the monthly output among all the NSG off-line coating lines worldwide

NSG GROUP   РОСНАНО   Glasswall   European Bank for Reconstruction and Development

Russian Architectural Glass Coating Infrastructure

- 5 total of active off-line coating lines in Russia
- 1 active coater in CIS (Homel', Byelorussia)
- 1 new coater in development (SalavatSteklo in Saratov)

- 2 of the total of 12 float lines are capable of pyrolytic coatings production

Total coating products production output: aprox. 48.600.000 m^2 as per 2016

Total market revenue per 2016 – 145.000.000 RUR (aprox. 2.340.000 EUR) <- about 2% growth in comp. to 2015

Present Products by General Types

K-glass

Solar control

Single-silver Low-E

Double-silver Low-E

Triple-silver Low-E

Special coatings:

- *Silvering*
- *Easy-clean coatings*
- *Electrochromic glass*
- *Low-reflective*

Present Products by General Types

˜ 2% of the market

K-glass

Solar control

Single-silver Low-E

Double-silver Low-E

Less then 0.3% of the market

Triple-silver Low-E

Special coatings:

- ***Silvering***
- ***Easy-clean coatings***
- ***Electrochromic glass***
- ***Low-reflective***

Less then 0.8% of the market

Climatic Conditions

Temperate continental climate:

- long cold winter, short but hot summer;
- large temperature deviations within twenty-four hours;

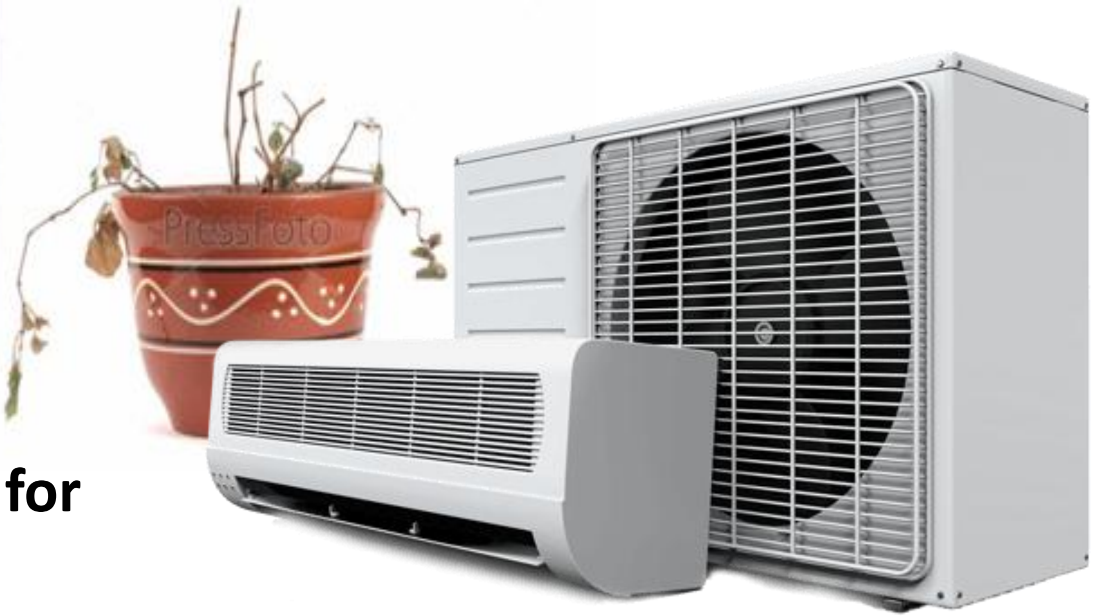
Схема расположения климатических поясов

Класс защиты	Климатический пояс	t воздуха зимних месяцев, °С	Скорость ветра * в зимние месяцы, м/с
4	Особый	−25	6,8
3	IV	−41	1,3
2	III	−18	3,6
1	I–II	−9,7	5,6

Infrastructural Specifics

- **Central heating:**

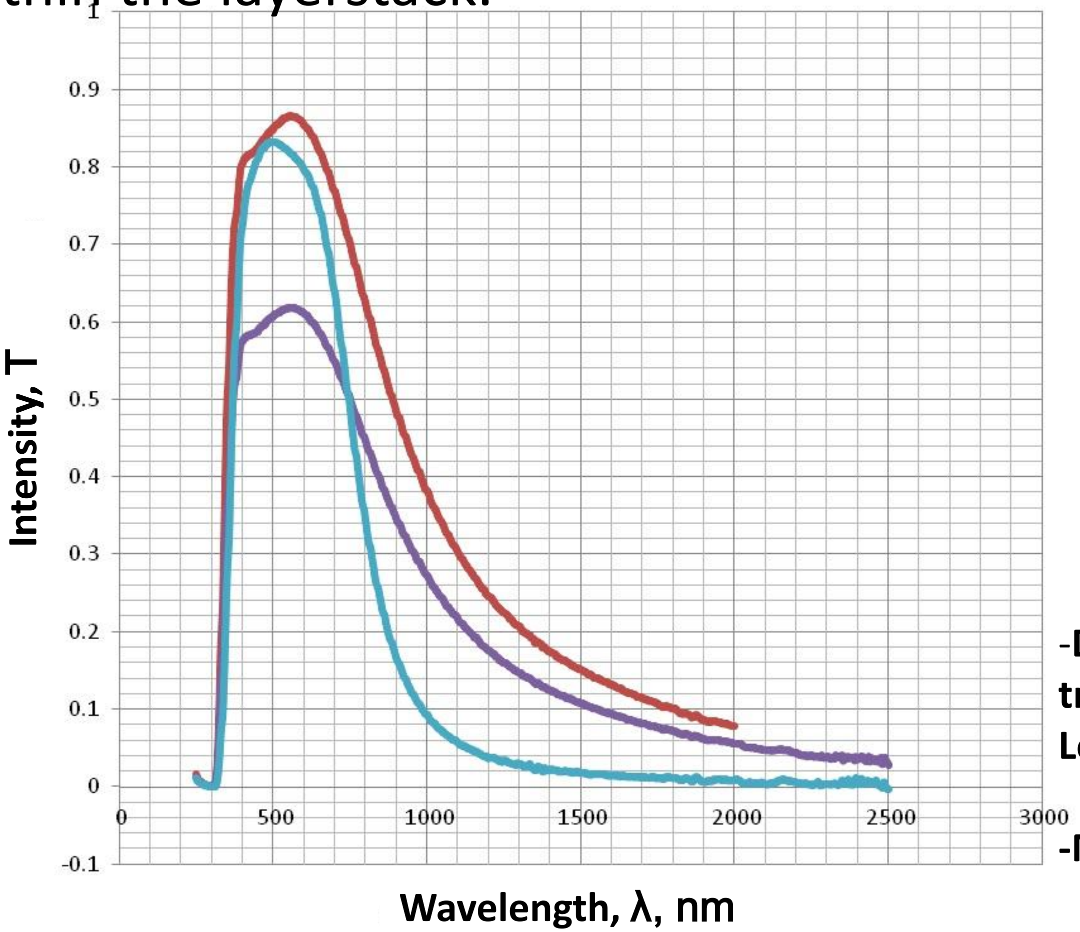
late switch on/off ;
no control within the sensible temperature range available;
regular ventilation required even during the mid winter times (!);



- **Air conditioning however is at the owner’s expenses for electricity**

Resulting Mass-product Requirements

Multi-functional platforms - also known as **high selective** - incorporate **two or more individual silver layers** within the layerstack.



-Minimize heat losses in winter time

-Minimize Sun-heat income in hot sunny days

Average single-silver Low-E

Low-E with a thicker Ag layer

Multi-functional high selective platform with two individual Ag layers

-Do not demonstrate drastic dropdown in light transmittance in comparison to the single-silver Low-E

-Minimize parasitic long-wavelenth UV income

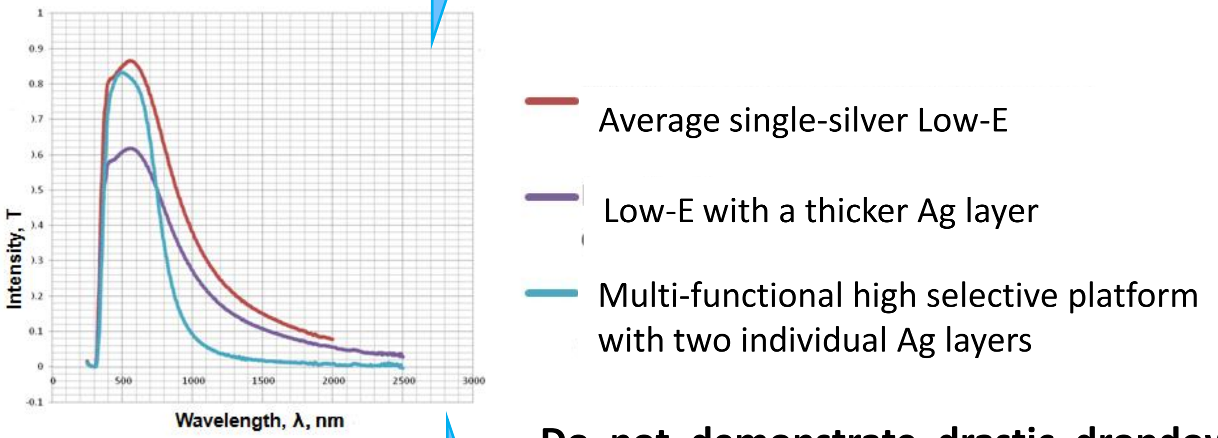
Resulting Mass-product Requirements

Required, but not too much, in order not to end up with the “greenhouse”-effect in winter and early spring, while the central heating is in operation

-Minimize heat losses in summer time

Required, but not too much, in order to allow some minimal additional sun-assisted heating in late autumn

-Minimize Sun-heat income in hot sunny days



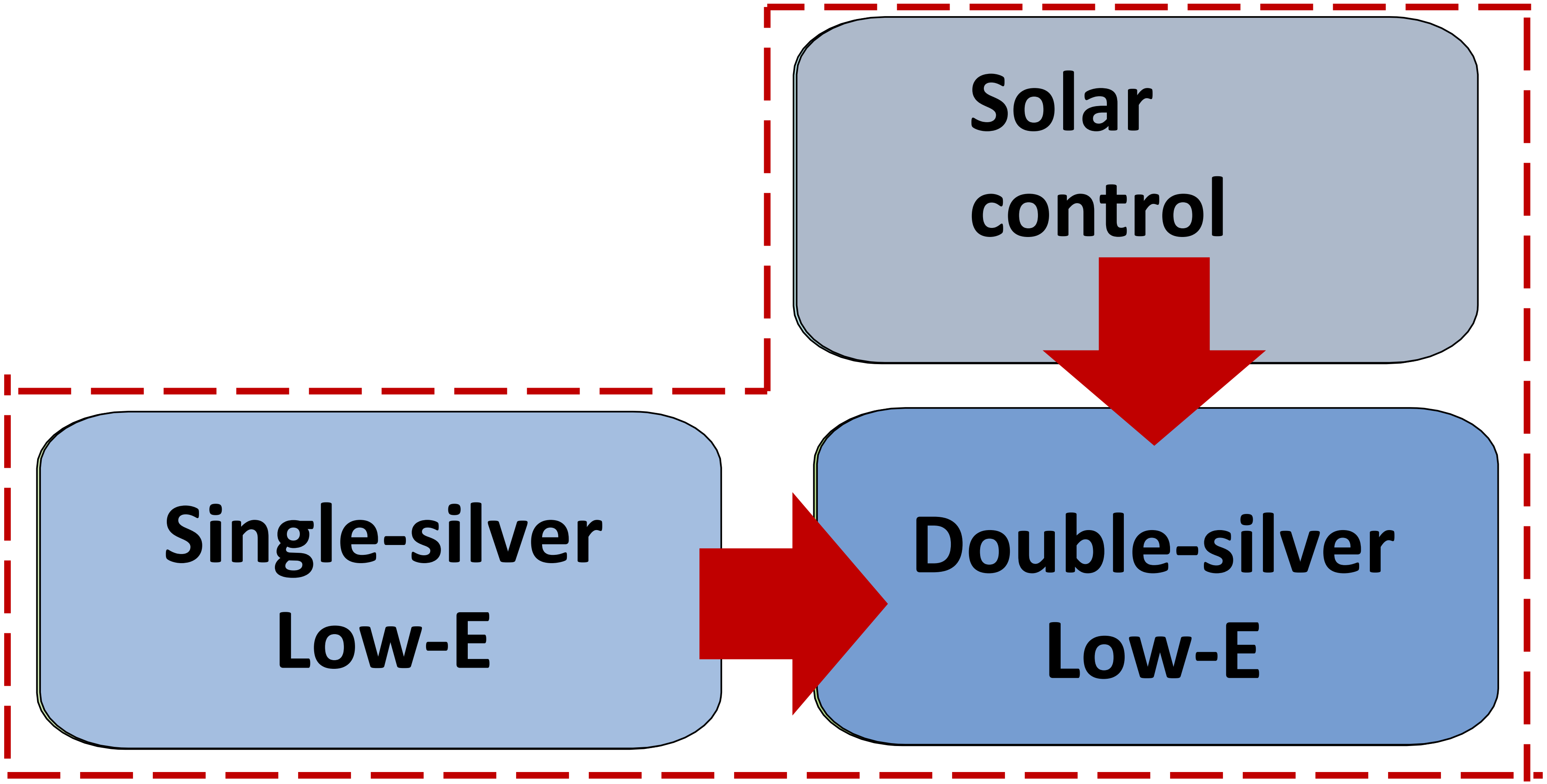
Maximum T required in order to maximize the efficiency of daytime external light usage

-Do not demonstrate drastic dropdown in light transmittance in comparison to the single-silver Low-E

Required

-Minimize parasitic long-wavelenth UV income

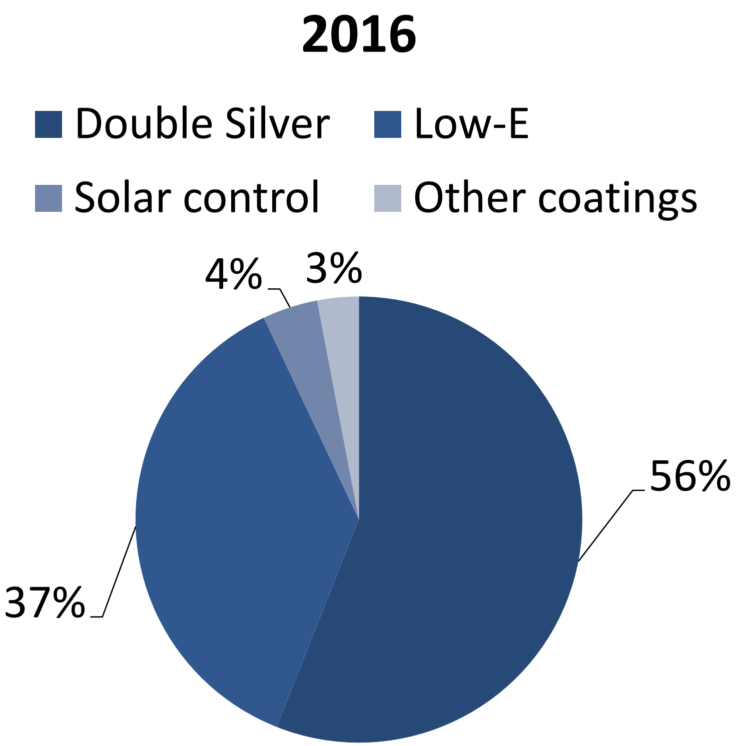
Product Demand Shift



Balance Between Architectural and Residential Markets

Balance Between Architectural and Residential Markets

62% Residential buildings glass market | **38% Architectural projects**



Balance Between Architectural and Residential Markets

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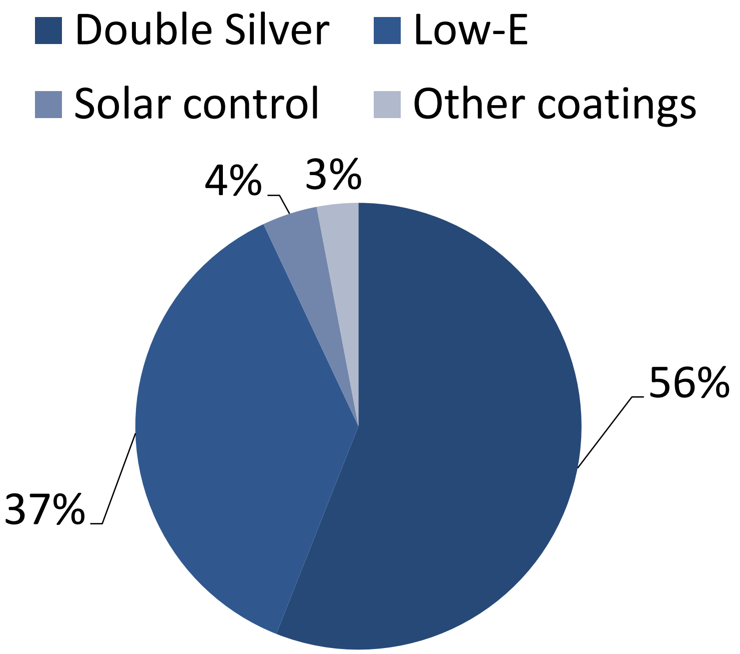
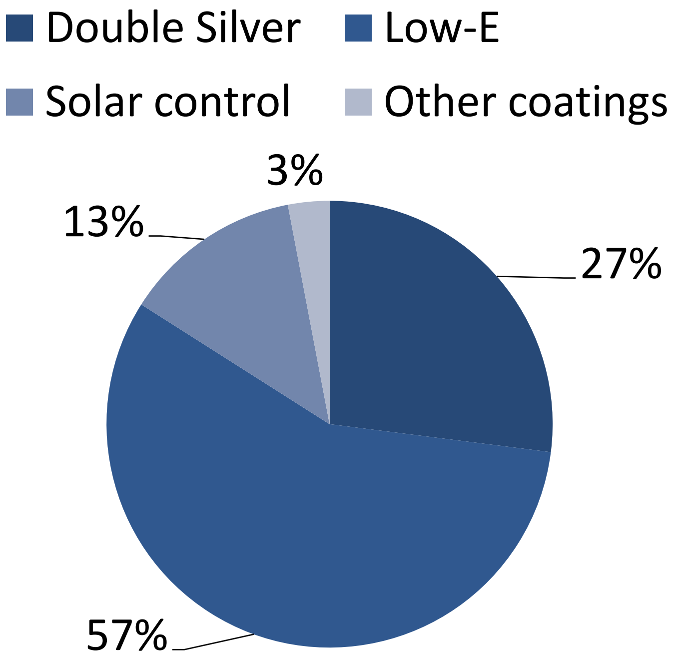
2016



2015



Balance Between Architectural and Residential Markets

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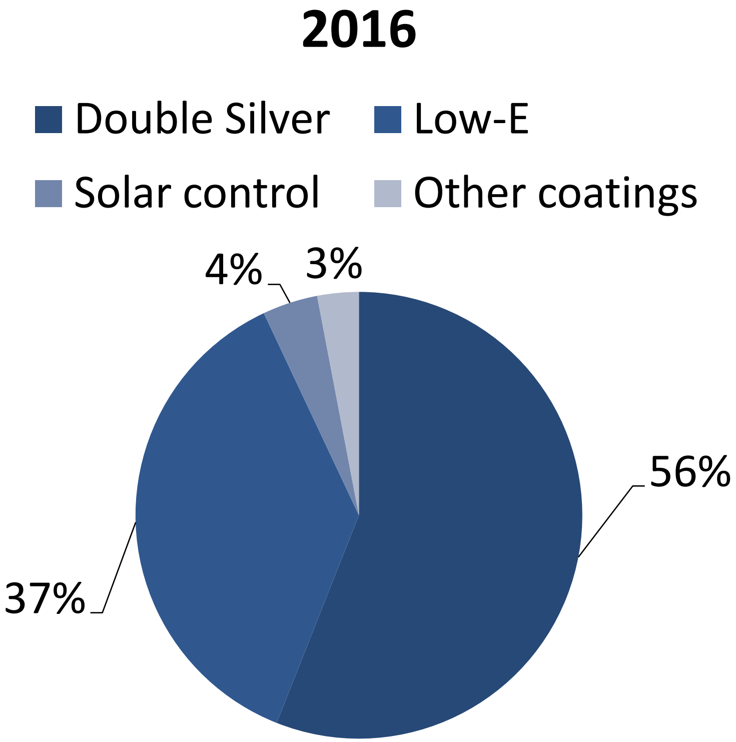
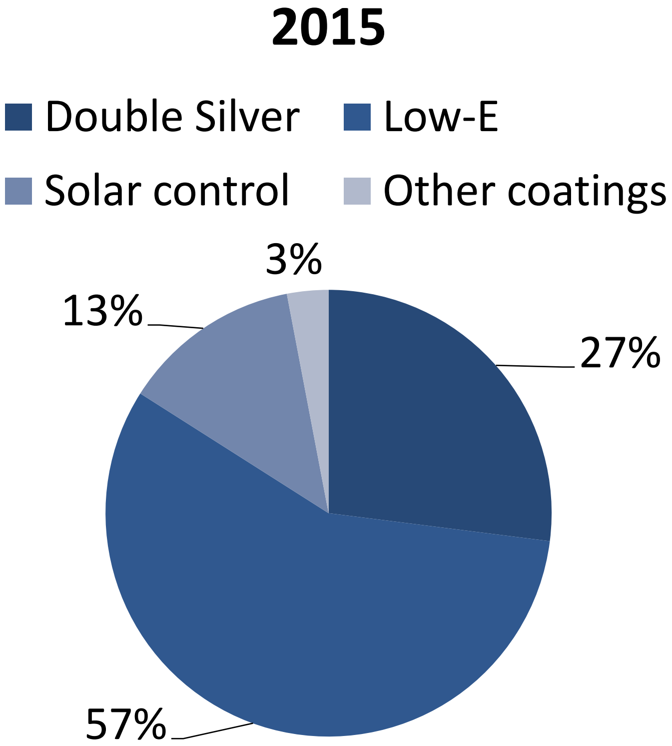
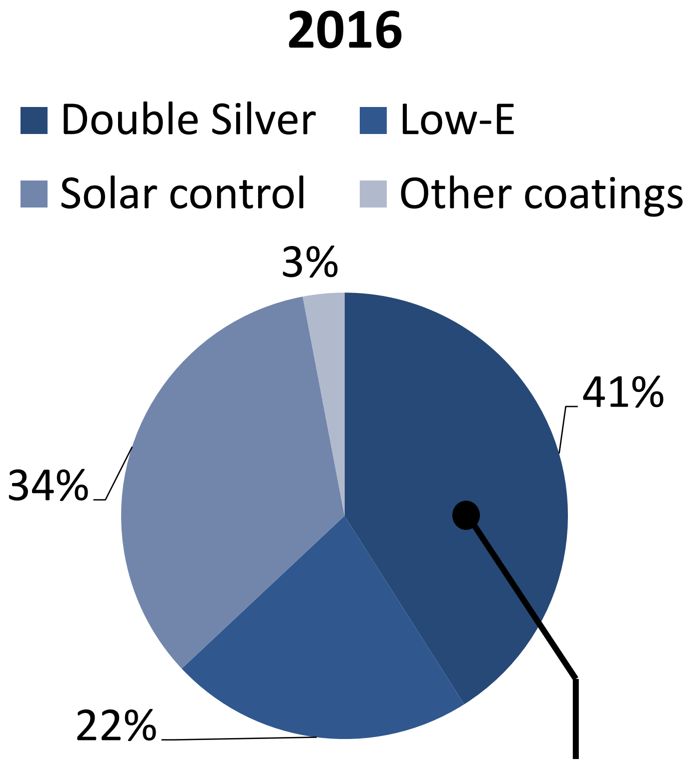






Fulfilling about 38% of total market capacity in 2015

Legislation and Related Market Trends

- **No current legislation for mandatory usage of Low-E coated glass in buildings;**
- **Such legislation acceptance would obviously serve as a mean for coated architectural glass market capacity jumplike increase:**

-acceptance of the according legislation in Ukraine in 2015 increased market demand on 68% withing the first two months

- **A project for the according Governmental Standard Building Norm (СНИП) has passed the second reading;**
- **Current preventing factors:**

- deflecting lobbyism from the side of non-transparent construction elements manufacturers
- high level of import dependency for the downstream manufacturing technological capabilities and required consumables
- outdated related governmental standards to be revisioned

- **Updated legislation acceptance currently expected within the next 4 years;**

Other Economical Aspects

EXPORT ORIENTATION TREND:

- **High Ruble-to-other-currencies rate due to the current geopolitical situation**
- **Emerging markets (Iran, countries of South America)**

-In 2016 export part of Pilkington Glass Russia&CIS was 34% of the total production outcome (coated glass considered only): Iran, Iraq, Turkey, Emirates, Ireland, Australia, Mexico, Chile, Brazil, Saudi Arabia (+ Ukraine, Byelorussia, Kazakhstan)

- **This leads to the local market "vacuum"**

-resulting in import increase, especially on the eastern part of Russia

- holds the market price dynamics

Other Economical Aspects

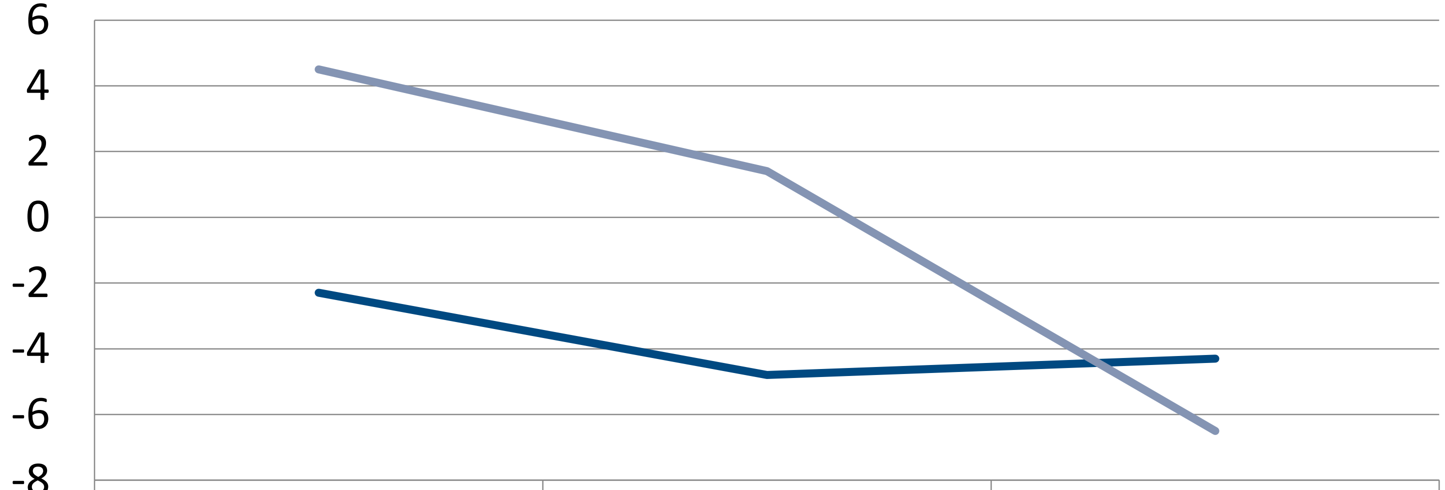
IGU MANUFACTURERS CONSOLIDATION TREND:

- **Current consolidation level – about 5%. Current number of market players – about 1500**
- **Expected consolidation level for the end of 2017 – 7%. Expected to achieve 30-40% in 2022-2025**
- **Impact on the coated glass manufacturers: customer's demand orientation more towards complex solutions**

CURRENT REORIENTATION TOWARDS RESIDENTIAL MARKET PART TREND:

■ **Architectural projects initiation dynamics**

□ **New buildings exploitation start dynamics**



	2014	2015	2016
■	-2.3	-4.8	-4.3
□	4.5	1.4	-6.5

THANK YOU FOR YOUR KIND ATTENTION