



**ЦЕНТР  
РЕСУРСОЕФЕКТИВНОГО  
ТА ЧИСТОГО ВИРОБНИЦТВА**

# **VLKZ PJSC (Vishnivskiy foundry and forging plant)**

## **RECP implementation expertise**

### **Kyiv region**



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,  
Education and Research EAER  
**State Secretariat for Economic Affairs SECO**



**UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION**



## **VLKZ PJSC (Vishnivskyi foundry and forging plant)**

Founded in 1969.

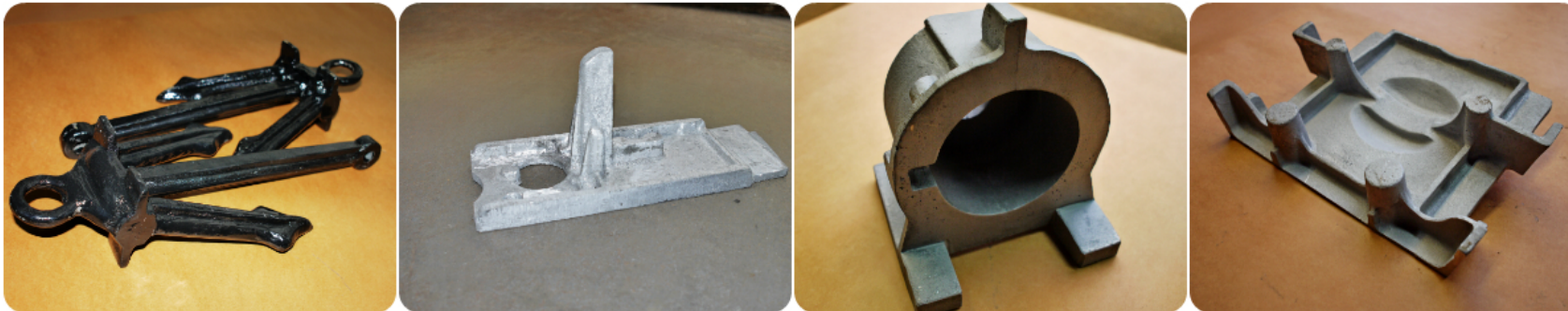
Company principal business: shaped castings and stampings for aviation industry, national economy and households.

Overall staff – 130 employees.



## FOUNDRY

Foundry is focused mainly on manufacturing castings from structural and stainless steels, aluminum and copper alloys for the aviation industry.



art and decorative casting





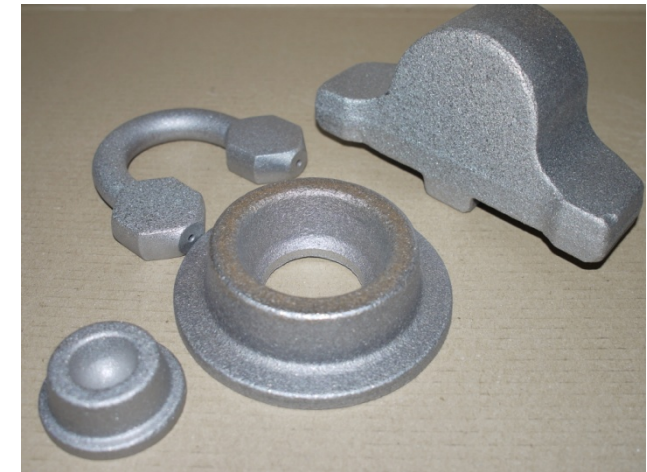
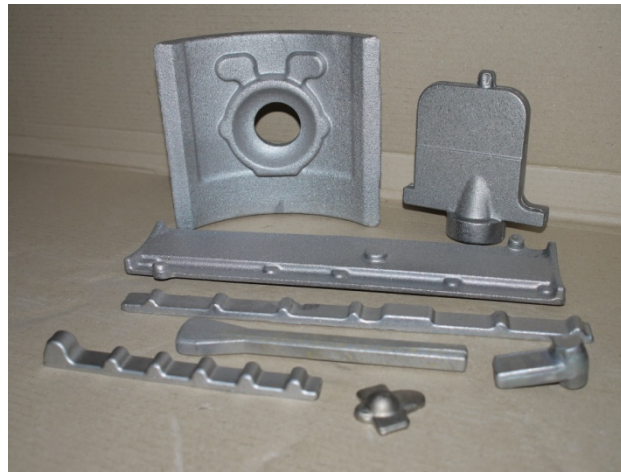
## Principal Technological Equipment/facilities

- Foundry furnace/smelters for various alloys
- Molding and rod type
- For specified foundry types
- Purifying/cleaning
- Thermal



# Forging

**Forging is mainly focused on manufacturing forgings for various purposes from aluminum, copper-containing, titanium alloys and steels**



**Forging workshop output – 1800 t per year**

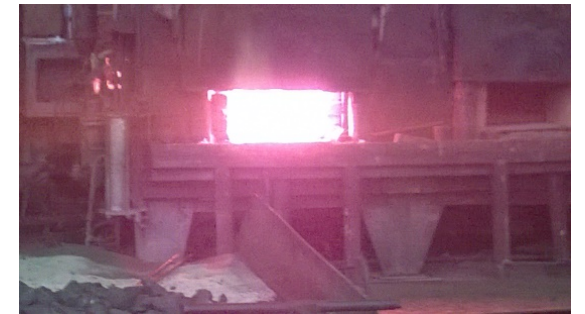


## Milestones

- Pre-assessment
- In-depth assessment
- Personnel training
- Technical options design and implementation

## Pre-assessment

- Casting for Al-alloys
- Furnaces for thermal treatment
- Plant office buildings



## Personnel training and technical options designing

- RECP methodology training
- Technical options designing and assessment

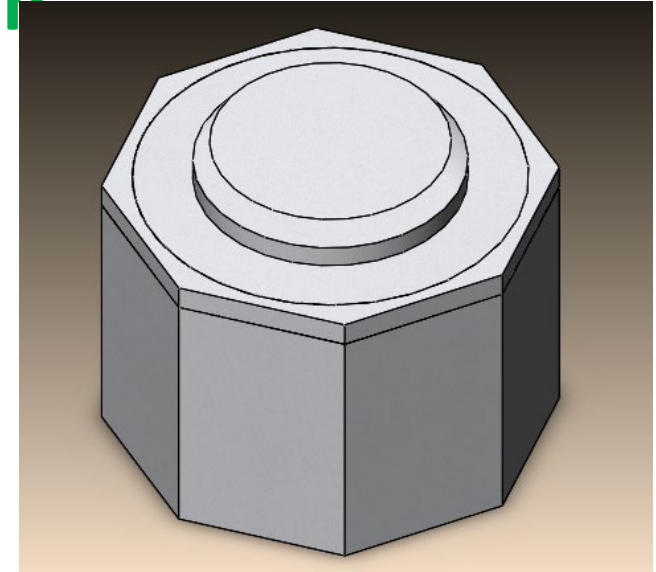
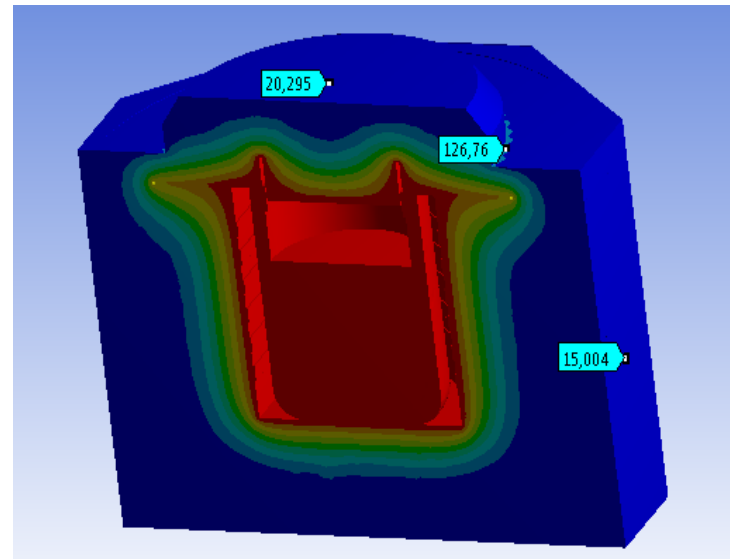






## On-site options implementation

- Casting furnace design update, options evaluation
- Modeling heat loss



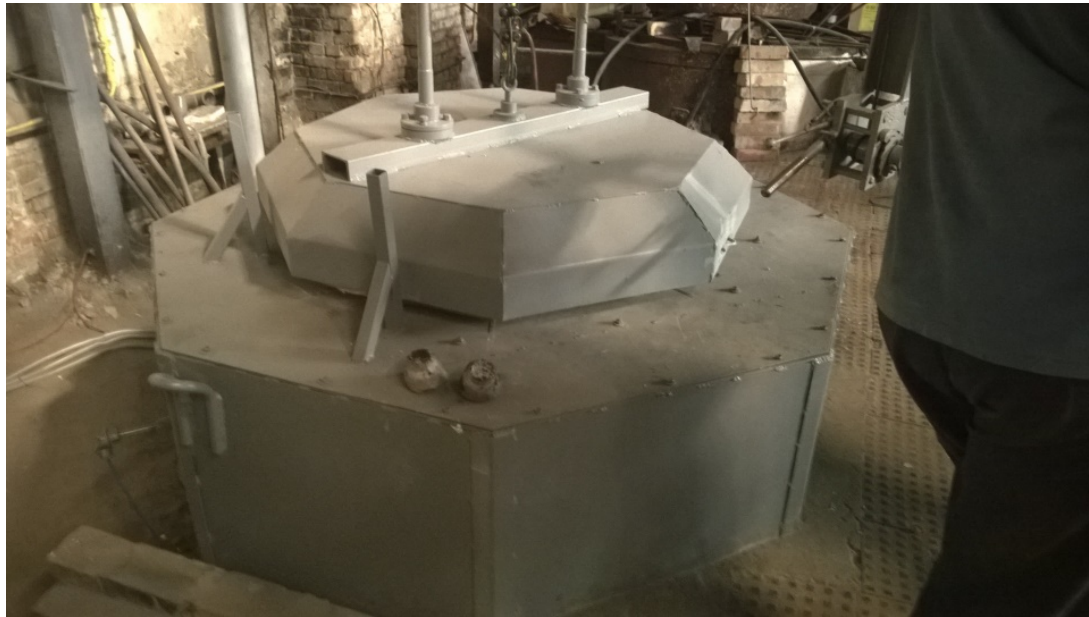
## On-site options implementation

### ➤ Casting furnace installation



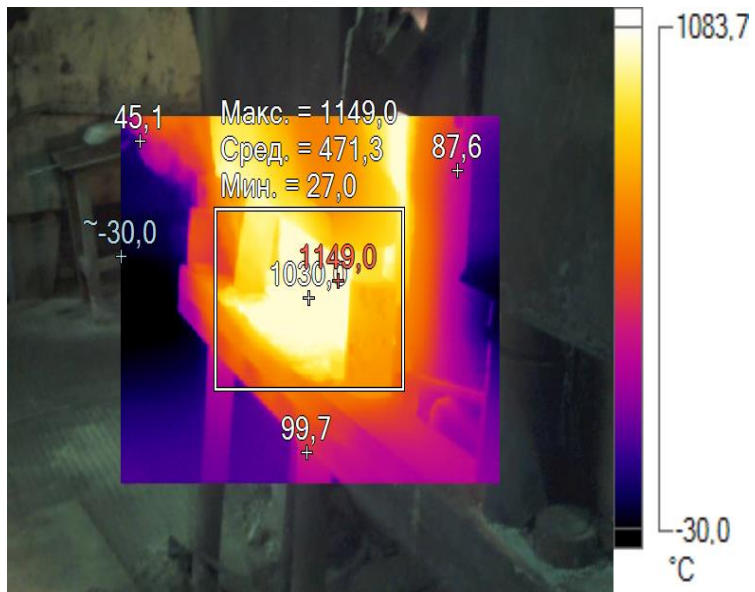


## Outcomes



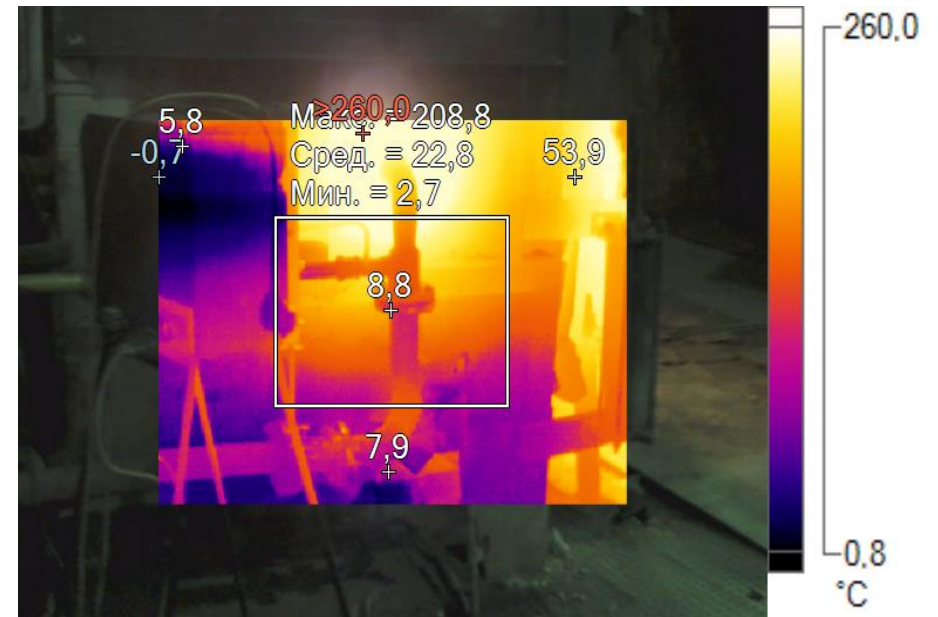
- Reducing casting period
- Reducing power consumption
  
- Before: 1700-1800 kWh/t
- After: 900-1000 kWh/t

## Gas-fired heating furnace



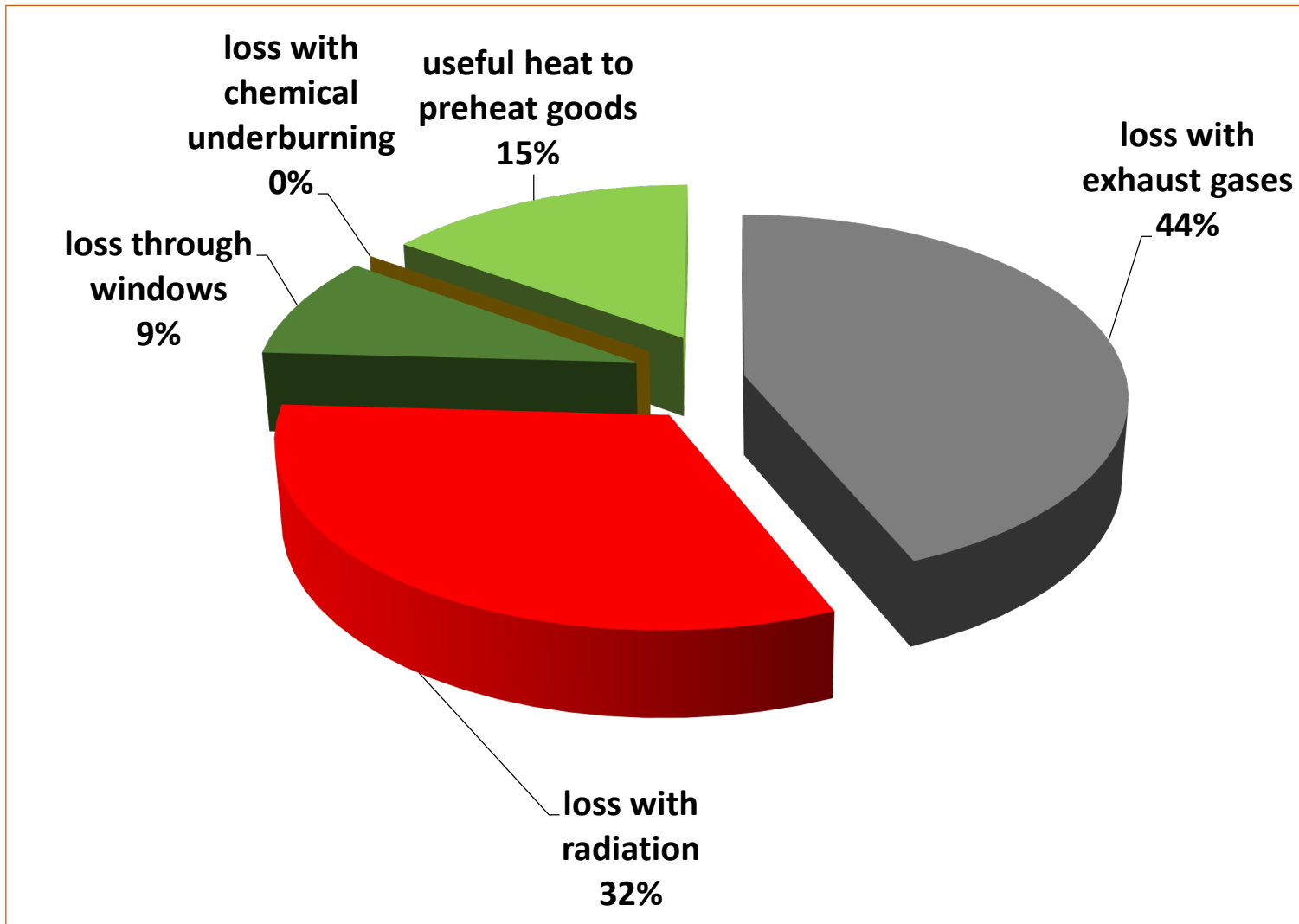
Working window

## Window and a gas-burner





# Furnace heat balance





## Technical options and efficiency

	<b>Furnace efficiency, %</b>	<b>Natural gas specific consumption, m<sup>3</sup>/t</b>	<b>Annual natural gas savings, m3</b>	<b>Economic effect, UAH</b>
<b>Baseline</b>	<b>15</b>	<b>120</b>		
<b>Restoring working window door and sealing the window for gas-burner and thermocouple</b>	<b>21</b>	<b>97,8</b>	<b>2,400</b>	<b>19,200</b>
<b>Gas-burner replacement</b>	<b>17</b>	<b>108</b>	<b>0,800</b>	<b>6,400</b>
<b>Lining replacement</b>	<b>16</b>	<b>113</b>	<b>0,500</b>	<b>4,000</b>
<b>Overall furnace renovation and installing recuperation burner</b>	<b>Up to 42</b>	<b>43,5</b>	<b>5,400</b>	<b>43,200</b>



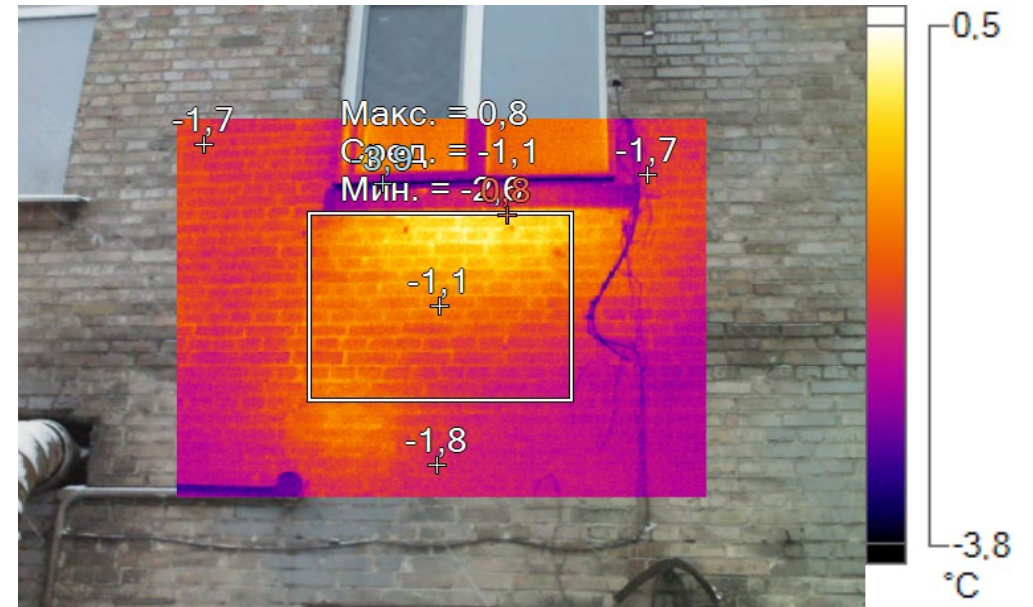
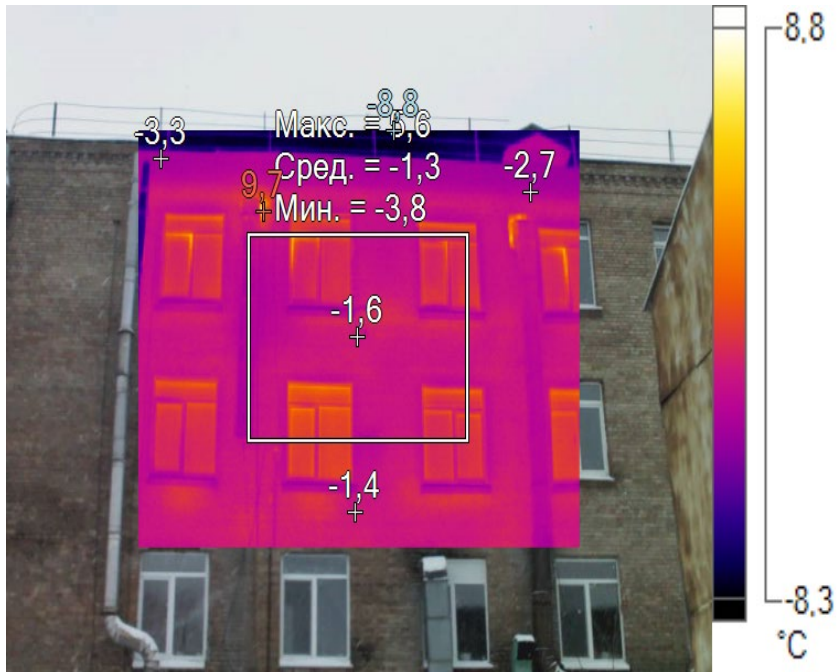
## Office building

- Thermal imaging of the building envelope
- Detecting heat loss spots
- Building heat balance calculated
- Technical options for thermal insulation developed



# Office building

## Heat loss



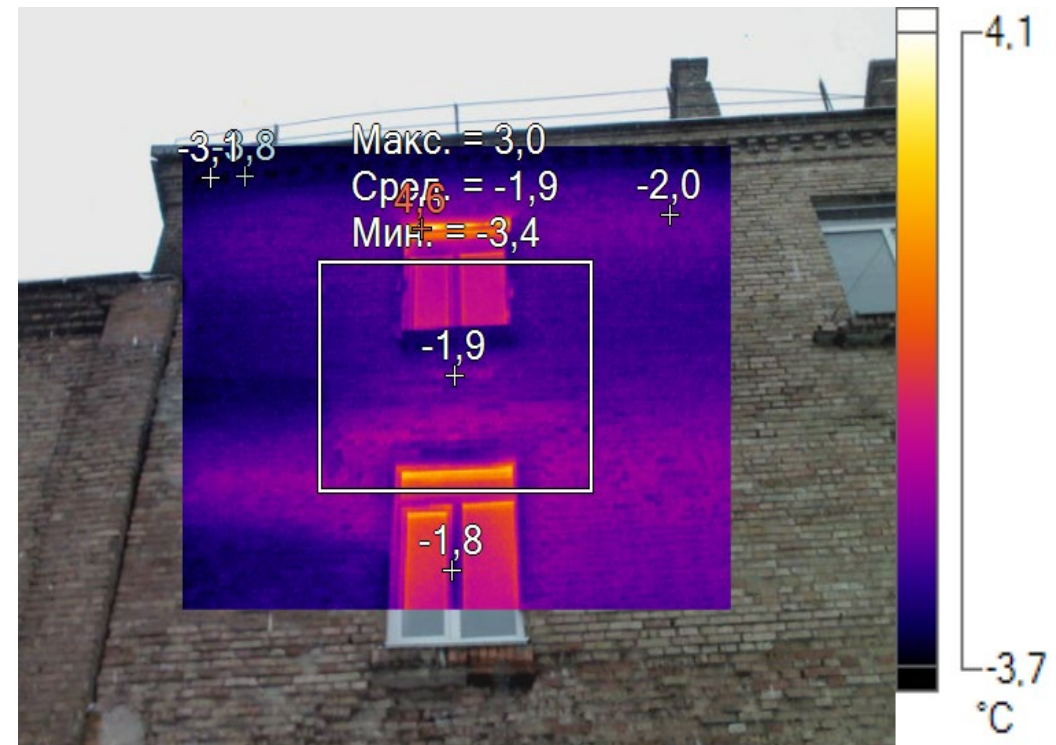
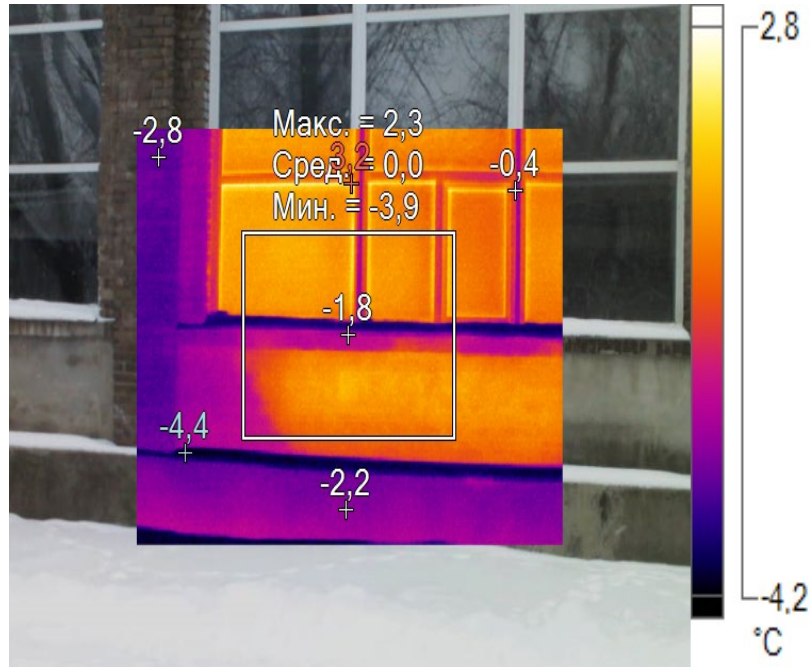
Windows in the building installed very improperly





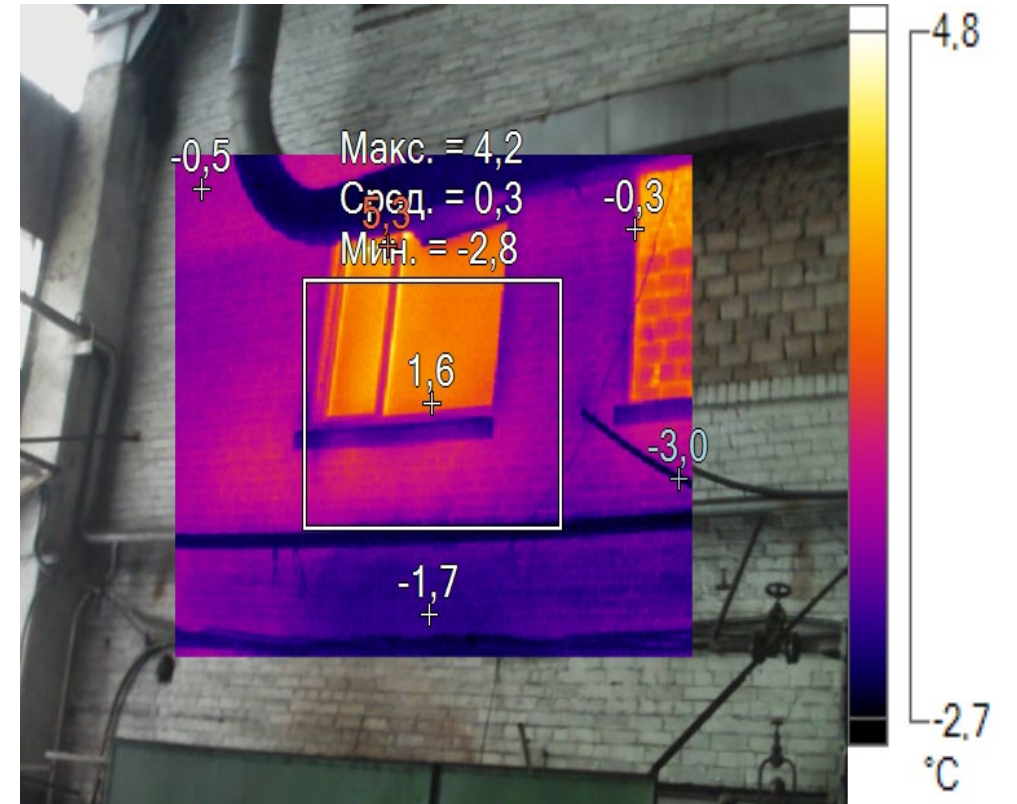
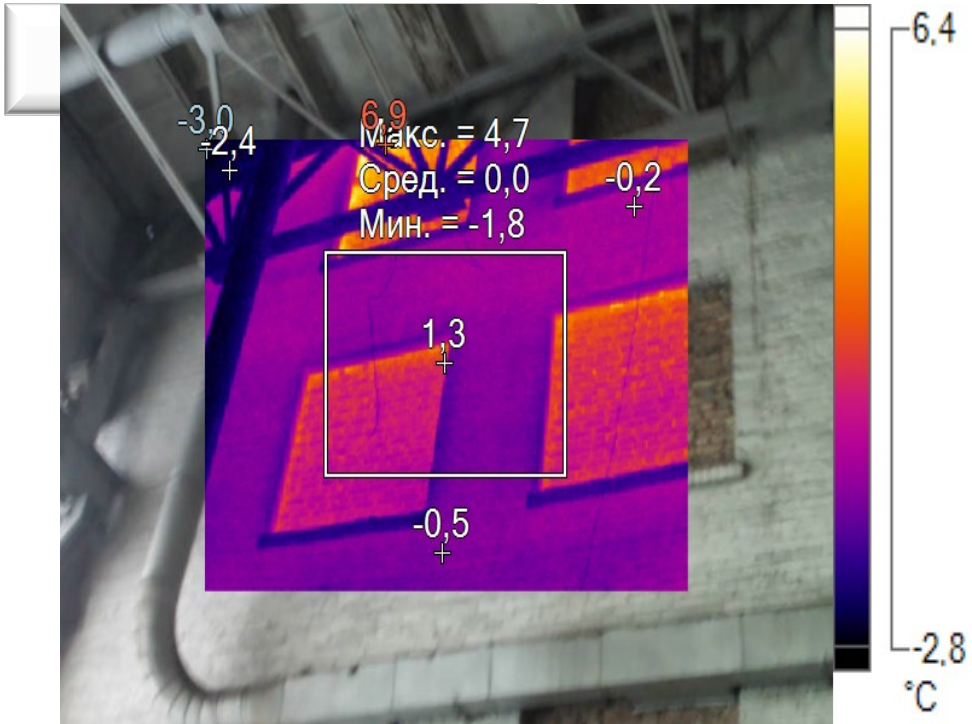
## Office building

### Heat loss



The brick work damaged or improper

## Office building

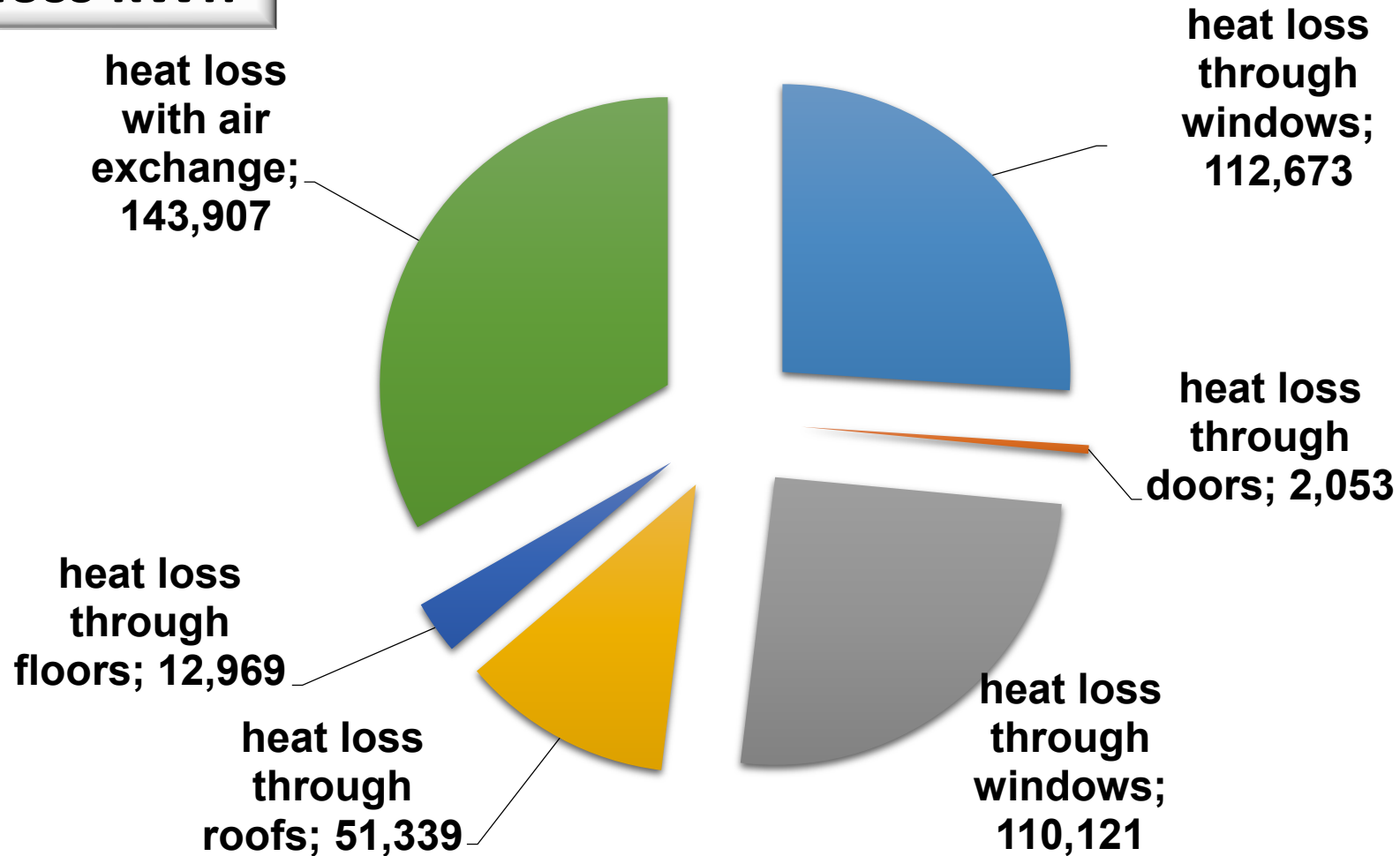


**New brickwork made instead of withdrawn windows**



## Office building

### Heat loss kWh





## Office building

### Heat loss

- Heat loss through building envelope 55%
- Heat loss through the roof 15%



## Overall results

- **Reducing power (electricity) consumption during Al casting amounts to 19,500 kWh equaling to UAH 39,000**
- **Applying thermal insulation of the office building will reduce pellets consumption by 66 t equaling to UAH 133,000**



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