

SUMMARY

Report on the topic:

«Energy efficiency and planning energy conservation. Evaluation of energy efficiency Representative of the Olympic Games Sochi-2014»

Estimation of the energy efficiency projects selected representative of the Olympic Games Sochi-2014: a large ice rink, hotel, office complex showed they conform with relevant local regulations and recommendations.

As the standards and guidelines were used:

Rulebook 50.13330.2012 «Thermal performance of the buildings». Updated edition of SNIP 23-02-2003.

STO NOSTROY 2.35.4-2011 «Green building. Buildings and civil construction. Consideration of regional characteristics in the rating estimation of sustainability in building construction».

National standard of the Russian Federation 54954-2012 «Conformity assessment. Ecological requirements for estate properties».

By thermal energy project large ice palace is estimated by energy efficiency class – «high». Annual savings of thermal energy relative to baseline can be up to 8132 million kWh (about 60%), electrical – 4011 million kWh (about 11%).

Building thermal performance indicators (Thermal performance of the building) exceeds the norm by 26%.

At the facility applied adaptive ventilation system with heat recovery, saving up to 70% of the thermal energy.

By thermal energy is measured at the hotel project efficiency class – «normal». Annual energy savings relative to baseline can be up to 483 million kWh (10%), electrical – 813 million kWh (12%).

Thermal performance indicators exceed the rates of 9%.

The hotel uses traditional systems of ventilation and air conditioning (chiller-fan-coil).

By thermal energy office building project is estimated by energy efficiency class «high». Annual savings of thermal energy relative to baseline can be up to 253 million kWh (18%) and electricity – (8%).

Thermal performance indicators exceed the standards by 16%. The office complex used ventilation system with heat recovery.

Reducing carbon dioxide emissions, sources of energy representative objects, according to the design data is as follows:

- To a large ice palace – 4584.5 t.CO₂/year;
- For hotels – 556.3 t.CO₂/year;
- For an office complex – 297.4 t.CO₂/year.

Calculation of the reduction of CO₂ emissions based on an analysis of the structure and projections of the combined production of electricity power system of the Energy System South by the method developed by LAHMEYER INTERNATIONAL commissioned by the European Bank for Reconstruction and Development.

Recommendations in this report will improve the energy efficiency of sports facilities and infrastructure.

The comments and recommendations to improve the energy efficiency of the representative of the Olympic Games Sochi 2014:

- Unfortunately there is no information in the projects of the variant analysis and modeling energy consumption of buildings;
- Energy certificates of buildings made without analyzing the impact of internal heat generation on the performance of degree-days, which may lead to an overestimation of the thermal energy consumption by 20%;
- High cost of electricity accounted for pumps and fans, reflecting the high pressure drop in pipeline networks. Should optimize the speed of stream in pipelines;
- In the projects of hotels and office buildings should be considered an underfloor heating and cooling systems, which have a higher comfort and energy efficiency;

- In the projects it would be appropriate to use alternative energy: – heat pumps and solar heating systems;
- To reduce peak loads in the summer it would be appropriate to use the cold accumulator, rechargeable night.