

Ecological revitalization of a university

Hammering sustainability by education, research and demonstration

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Warsaw University of Technology (WUT)

Polish Energy Conservation Agency (KAPE)



Why university project?

- EU sustainable policy implementation in Poland requires new reviving impulse to somewhat fossil approach to energy issues nowadays,
- Universities receive political support and priority at national and local level to meet intellectual ambitions of Poles, in return they should present initiative and ability to response to these social demands,
- Contradiction between „teaching high-tech” in „museum technical surroundings” at many universities,
- Universities strongly need a model project of up-grading technical infrastructure meeting high technological and environmental standard.
- Lack of engineers with high awarenesss of importance of eco-design, enviromental approach and sustainable development,
- High costs of maintenance due to high energy bills at universities.

Political demand

Social demand

Knowledge demand

Demand of economy

Energy costs

2



Main Building, pl. Politechniki 1



3



Warsaw University of Technology

The Polish National Energy Conservation Agency



Why WUT?

- WUT has outstanding record in teaching and co-operation with industry in sustainable energy issues,
- Project is in full synergy with education at WUT,
- WUT aims at becoming a leader in environment and energy education and RTD in New Member States with doors open for Accession Countries and CIS,
- WUT buildings are the pride for both - WUT community and Warsaw city and as such require special treatment in scope of maintenance and modernization,
- Long payback period project due to historical nature of buildings,
- Old infrastructure not meeting even the average energy efficiency standards,
- Negative image of „best technical university in Poland” confronted with anti-ecological campus,
- WUT located in city centre shall meet high ecological standards,
- Leading role among technical universities in Poland ensures efficient replication of the model developed,
- Possessing critical mass for large EU programs covered by JASPERS,
- Project fits directly into broad sustainable vision of WUT covering teaching, research and public image,
- High intellectual, technical and organisational potential gathered,
- Highly motivated team.



Why KAPE?

- KAPE serves as national energy efficiency agency being under control of the government.
- KAPE has been involved in more than 150 international projects on RUE and RES.
- KAPE is capable of managing big EU projects.
- KAPE has internal administrative and financial procedures fulfilling EU requirements.
- KAPE has had for years fruitful co-operation with WUT.
- „Ecological revitalization of Warsaw University of Technology” project is very similar to Concerto Plus in which KAPE takes part.



General description

- **General background:** wish to transfer the present university into:
 - coherent system of educational and RTD activities
 - being carried out in modern building stock serving as a „dispersed laboratory” of sustainable energy and environmental issues
- **Project objective:** revitalisation of building stock of WUT to meet the standards of sustainability while preserving its historical values and beauty
- **Involved parties:**
 - Warsaw University of Technology (WUT) – beneficiary,
 - Ministry of Economy – politically supporting body,
 - The Polish National Energy Conservation Agency (KAPE) – local technical and supporting agency.



Project pillars

Ecological revitalization of Warsaw University of Technology

**Energy
Efficiency**



Thermal vacuum
modernization
Energy mirror
Energy management
systems

RES



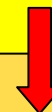
PV-Panels
Solar collectors
Heat pumps
Integrated solar facade
systems for air-conditioning
and hot water

**Distributed
CHP & DH
System**



Local CHP units
Monitoring & Controlling
Thermal Renovation of DH
System

**Environmental
Protection**



CO₂ emission
reduction
Air quality
improvement
Reduction of fossil
fuels

Dispersed Laboratory accessible for students

General project objectives

- Rising public awareness on sustainable development by successful demonstration,
- Opening of new RTD in areas covered by the project,
- Enhanced educational impact on students by presenting high sustainable technology on site,
- Giving students impulse to focus more on sustainable approach in engineering practice,
- Freeing land and buildings for new WUT activities,
- Preserving historical values and beauty of WUT buildings,
- Serving as model approach to university and public authorities elsewhere,
- Better understanding of sustainability barriers and provide detailed know-how transferable to other universities,
- Stating visible prove of successful EU co-operation with high social impact,
- Opening market for high technology in Poland.



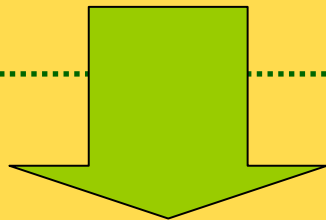
Detailed project objectives

- to reduce demand for heating, cooling, electricity, and ventilation through high efficient and innovative solutions – **44% energy reduction**
- to reduce CO₂ emission – **9 500 t CO₂ annually**
- to save environmental resources - the reduction of dust and gas emissions to environment resulting from smaller demand on electricity and heat,
- to reduce costs of the exploitation which results from thermomodernisation,
- to improve thermal comfort,
- to improve students education comfort,
- to increase education accessibility, particularly for people living outside of Warsaw,
- to improve esthetics of WUT buildings which will influence to Warsaw architectural surrounding.



WUT – towards EcoUniversity by

- Opening new educational & RTD activities in the EU region,
- Reduction of energy needs and increased use of renewable energy sources,
- Reduction of greenhouse gases emission due to efficient energy management,
- Establishment of multi-dysciplinary Sustainable Energy Centre acting in educational and RTD fields.



Preparation of model project

EcoUniversity



Other universities

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Risks

- Public procurement procedures,
- Acquiring building permits for all buildings,
- Obtaining technical agreements,
- Acquiring the approval of the Warsaw Historical Buildings Conservator required for majority of the buildings,
- Bridge financing valued at 33% of the project costs,
- Reaching local consensus on applied technologies,
- Complexity and novelty of the project.

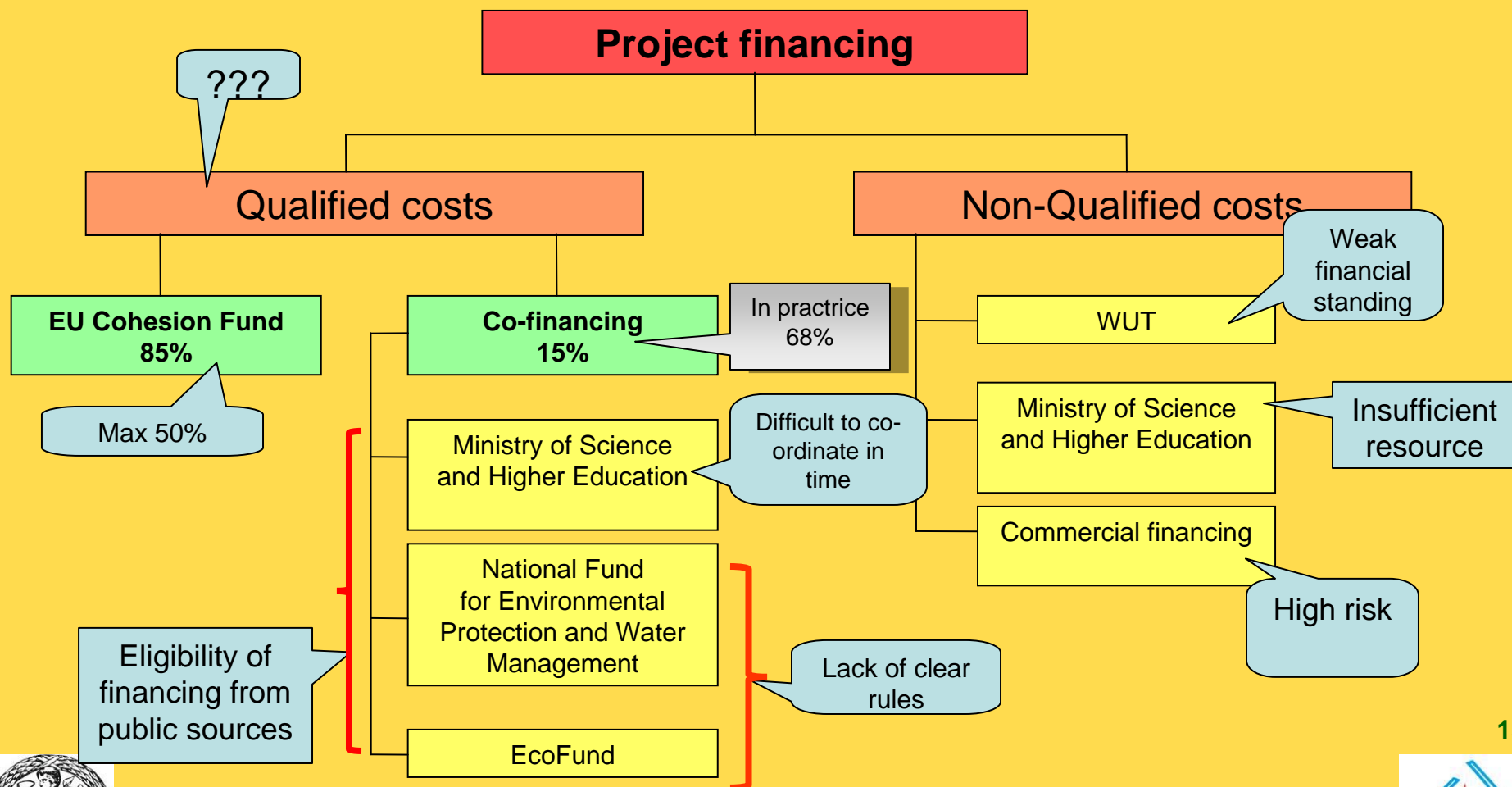


JASPERS Support

- Making the project suitable for EU cohesion funding,
- Reviewing proposed technical solutions to keep high innovation standards,
- Shaping the project to meet EU priorities,
- Providing advice and guidance on rules and procedures to avoid unnecessary administrative burden,
- Provide consultancy on optimal financing and governing rules,
- Planning the schedule so that to avoid bottlenecks and make the project running smooth,
- Making general review of the proposal so that to avoid evident errors in application phase.



Project financing



Challengies encountered

- Initial reluctance from technical staff of WUT
- Lack of confidence in success from all parties
- Lack of rules and guidance from governmental side. Lagging legislation and frequently changing rules!
- Unclear co-financing rules from Polish side. Eligible costs? Public support?
- Difficulties with co-ordination with other pending projects at WUT.
- Fear of making financial burden to WUT due to lack of strong financial standing. It is university!
- Insufficient financing from EU side 50% max.

Costs of „educational elements” proven non-eligible.



Lesson learned

- Fast adaptation of WUT technical staff to requirements of the EU project (technical, financial, administration). **Gain of knowledge and strengthening personal position.**
- Strong support from the rector of WUT.
- Effective project manager. **A necessity.**
- Good co-operation between parties involved (WUT, KAPE, Jaspers). **Common interest of a team.**
- Strong personal involvement of some individuals. **Leaders!**
- Growing interest in project from other universities. **Advantage of being a leader.**
- Absolute indispensable role of Jaspers support. **Pilot project!**



Public sector (university)

- Entirely rely on public funds,
- Weak credit position,
- No profit organisation with some elements of profitable activities negligible from economic point of view but extremely complicating economic clearness,
- Lack of experience in financial engineering, avoiding of risks,
- Administrative structure incapable to undertake large projects in complicated surroundings,
- Regular shift in governing structures,
- Lack of co-ordination between investing in infrastructure and knowledge (gap between different Operational Programs at national level)



Conclusions

- A gap in capacity between old and new MSs exists - necessity to recognise and understand the „the other bank needs and limitations”,
- A tendency to limit the financial support to be below the threshold of acceptance for public sector („no EU support for weak”),
- EU support for infrastructure and capacity building as well as for RTD,
- All „3J” should receive better understanding and support from the MSs governments.

