



Environmental policy in sustainable university development

July 2018

ECOUMED POLICY: INTRODUCTION

Medical University of Lodz is an active research, didactic and clinical centre. Our development relies on a modern research base and a highly specialised team of academic teachers.

The university research areas are primarily focused on modern-age diseases including cardiology, oncology, diabetology, metabolic diseases, physiotherapy. We educate future medical specialists at 16 majors, including military medicine where, as the only university in Poland, we educate future military doctors. Currently, the total of our students amounts to 9,500.

By constructing the campus of MUL Clinical and Didactic Centre (CKD) we are designing a new organisation structure, the inner scheme of support for our development. Wide arrangement of social surroundings obliges us to a balanced design of our activities. Medical University of Lodz provides educational and health care service as well as research and implementation. We aim at achieving intellectually and technologically advanced effects of the highest possible value. While using the environmental resources we should be guided by the formula of moderation and added value. With the sustainable development in mind, we will prove our uniqueness by 'give more than you take' rule.

ECOUMED POLICY: PLAN OF ACHIEVEMENTS

ORGANISATIONAL AREA

- Creation of the organisational scheme including motivation to implement the strategy and relationship with natural environment
- Building the university value via innovation research and development projects
- Implementation of sustainable construction projects management in constructing energy-efficient and passive infrastructure
- Increasing the self-improvement urge in our employees and students

SOCIO-ECONOMIC AREA

- Improvement in the ergonomics and technical condition of the current and future Campus infrastructure
- CKD green areas regeneration to meet the needs of health care system, academic society and inhabitants of Lodz region
- Operating costs reduction by implementation of low-emissions economy

ENVIRONMENTAL AREA

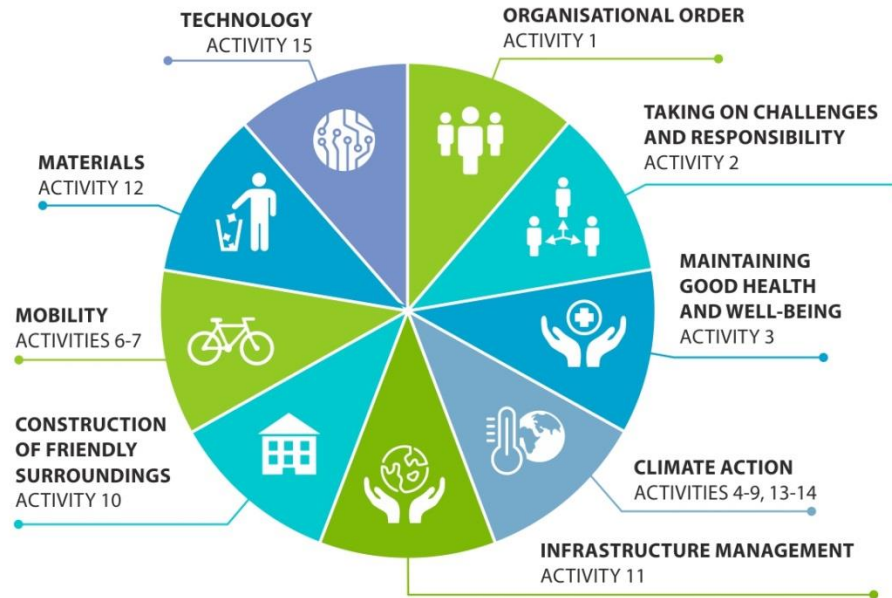
- Reduction in emissions of harmful gases
- Decrease of negative impact on the environment and the health of the inhabitants of Lodz region
- Promotion and implementation of the sustainability constructs and ecology code of ethics
- Raising the awareness of the influence which the local inhabitants have on energy management and air quality

STRATEGIC OBJECTIVES

- Improved access to complex and high quality health services
- Development and support of reliable health care system especially for healthy ageing via integrated primary care in chronic diseases treatment
- Development of analytical methods to assess the effectiveness of new solutions and technologies
- Raising the standards of undergraduate and postgraduate education for all medical professions and increasing the number of medical specialists and nurses
- Increasing the resources efficiency and the potential of unique methods

SOCIAL RESPONSIBILITY IN SUSTAINABLE DEVELOPMENT OF MEDICAL UNIVERSITY OF LODZ

VISION } Implementation of sustainable development in the university management, teaching programme and other activities so that it becomes part of social, environmental and financial excellence of Medical University of Lodz



ECOUMED ACTIVITIES:

1. Responsible University management based on the organisational order and creation of friendly surroundings
2. Establishing the University standard and value via innovative research and development projects
3. Improvement in the employees' and the students' performance to support integrated health care
4. Energy-efficient and passive construction
5. Improvement to the energy efficiency of the existing infrastructure
6. Support for integrated primary care via renovation of the area and infrastructure installation
7. Sustainable on-site traffic system at the campus
8. Installation of renewable sources of energy in the buildings
9. Increased effectiveness of water and sewage management
10. Sustainable Management of Construction Projects System
11. Monitoring and management of MUL premises via dedicated Building Management System (BMS)
12. Designing an integrated process of municipal and medical waste management
13. Promotion of healthy habits and pro-environmental attitudes in the students and inhabitants of Lodz region
14. Implementation of the initiative for natural environment protection
15. Exploration of technology and digital platforms

PROGRAMME FLOWCHART



ORGANISATION

1. **Responsible University management based on the organisational order and creation of friendly surroundings**
2. **Establishing the University standard and value via innovative research and development projects**
3. **The employees' and the students' performance improvement as a support for integrated health care**

INVESTMENT

/Green Campus/

4. Improvement to the energy efficiency of the existing infrastructure
5. Energy-efficient and passive construction
6. Support for integrated primary care via renovation of the area and infrastructure installation
7. Sustainable on-site traffic system at the campus
8. Installation of renewable sources of energy in the buildings
9. Increased effectiveness of water and sewage management

PROCESS BACKUP

10. Sustainable Management of Construction Projects System
11. Monitoring and management of MUL premises via dedicated Building Management System (BMS)
12. Designing an integrated process of municipal and medical waste management
13. Promotion of healthy habits and pro-environmental attitudes in the students and inhabitants of Lodz region
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DESCRIPTION OF THE ORGANISATIONAL ACTIVITIES OF ECOUMED

1.

Responsible University management based on the organisational order and creation of friendly surroundings

- Inner organisation order and motivation mechanisms to the strategy implementation and coexistence with the environment is the starting point

2.

Establishing the University standard and value via innovative research and development projects

- Research teams will undertake the project activities in the key, strategic areas and organisation & technology innovations will be widely applicable in society

3.

The employees' and the students' performance improvement as a support for integrated health care

- MUL involvement in prevention, early diagnostics and control of chronic diseases in order to facilitate functional independence and maintenance of occupational and social activity.

DESCRIPTION OF THE INVESTMENT ACTIVITIES OF ECOUMED

4.

Improvement to the energy efficiency of the existing infrastructure

- Modernisation of heat distribution networks and substations
- Thermal insulation of the buildings
- Replacement of the old windows with high-impact ones
- Modernisation of ventilation and air conditioning systems with heat recovery
- Replacing the old lighting with led lights system
- Installation of BMS sensors and controllers



5.

Energy-efficient and passive construction

- Construction and modernisation of the buildings in accordance with energy efficiency construction requirements issued after 2021
- Construction of new energy efficient buildings in possibly most passive technology
- Building passive tech accelerators and the centre for new technology promotion



6.

Support for integrated primary care via renovation of the area and infrastructure installation

- Creating user-friendly and environment-friendly green areas
- Health Academy formation by installation of laboratory modules to calculate the risk of chronic diseases
- Construction of a mini-amphitheatre for outdoor events organised at CKD Green Campus
- Renovation of green areas in line with the complex urban and spatial planning by the CKD Campus
- Construction of woonerfs, covered patios, theme streets



DESCRIPTION OF THE INVESTMENT ACTIVITIES OF ECOUMED

7.

Sustainable on-site traffic system at the campus

- Designing urban and spatial concept with optimal functionality
- Reconstruction of on-site traffic system to create an environment-friendly transport with limited car access
- Construction of cycle routes and pedestrian paths
- Creation of on-site ecological transport and logistics with autonomous cars
- Construction of multi-storey car parks in designated zones



8.

Installation of renewable sources of energy in the buildings

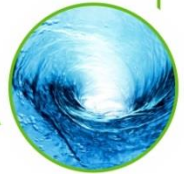
- Designing the concept of generation and use of renewable energy sources at the Campus
- Construction of heat pumps
- Installation of solar panels for central heating
- Construction of photovoltaic panel system



9.

Increased effectiveness of water and sewage management

- Improved quality of sewage drained to the municipal system by expanding the medical sewage pre-treatment and disinfection point
- Modernisation of the university's own water intake and water treatment stations
- Replacement of both water supply and sewage system pipes
- Installation of time batteries or photocell batteries at intake points
- Construction of rainwater retention and management system



ECOUMED

DESCRIPTION OF THE PROCESS BACKUP ACTIVITIES

10. Sustainable Management of Construction Projects System

- Implementation of the System of Sustainable Management of Construction Projects to support appropriate design and construction of new buildings as well as refurbishment of the existing buildings in compliance with environmental protection and energy efficiency rules and the technical requirements in construction after 2021



11. Monitoring and management of MUL premises via dedicated Building Management System (BMS)

- Design and construction of the Central BSM system for all the buildings of MUL premises which will allow for monitoring and management of all the systems of electric, heating, ventilation and cooling installations to meet the needs and demands of the surroundings.
- Implementation of plans and regulations of the optimal energy management to guarantee safety and comfort for the users and reduction of operating costs
- Development of guidelines for design projects in MUL



12. Designing an integrated process of municipal and medical waste management

- Integrated processes of waste circulation aiming at circular economy
- Minimization of waste production by selective waste collection and management



ECOUMED

DESCRIPTION OF THE PROCESS BACKUP ACTIVITIES

13. Promotion of healthy habits and pro-environmental attitudes in the students and the inhabitants of Lodz region

- Education for Sustainable Development including the issues of environmental protection and natural resources of the planet
- Systemic educational solutions using modern technologies of our region to change attitudes and habits in the academic and local society
- Popularisation of the ideas of environmental protection by ISO 14001



14. Implementation of the initiative for natural environment protection

- The University plan includes support and promotion of all the academic ecology initiatives and any initiatives which enhance environmental protection and any ideas of the reduced consumption of energy, heat and water in the university infrastructure



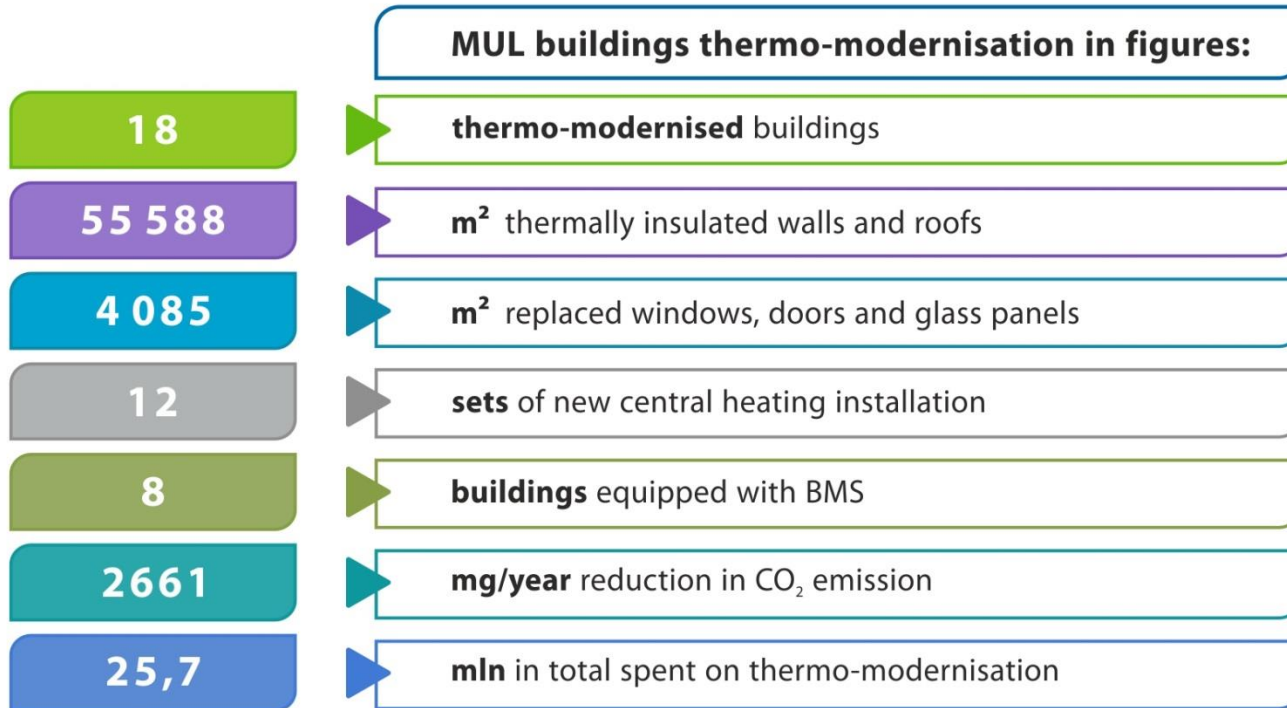
15. Exploration of technology and digital platforms

- Modification of products and services to lessen their negative impact on the natural environment, increased e-learning in the education processes
- Conversion of paper versions of fliers, manuscripts and research papers into digital media and e-publishing
- E-learning system and its procedures which enhance the university influence on environmental protection (e-learning processes and procedures, electronic papers, tests and exams)
- Conversion of conventional administrative procedures into electronic administration (intranet), electronic recruitment system (e-cards, e-student books, e-dean office)
- Digitalisation of library resources and creation of Digital Library



OUR PAST SUCCESSES IN ENVIRONMENTAL PROTECTION

Our concern for the environment and natural resources resulted in the Medical University of Lodz carrying out complex thermo-modernisation of a number of its buildings to reduce emission of harmful gases and negative impact on the natural environment and the health of inhabitants of Lodz.



Thanks to the knowledge and experience gained by thermo-modernisation and by monitoring its ecological effects we can use European Union funds in an optimal way to attain maximal energy efficiency on MUL premises.

ECOUMED PROGRAMME IS STRENGTHENED BY OUR PARTNERS



So far we have completed STAGE 4 of complex thermo-modernisation of selected MUL buildings thanks to the funds and loans from **Fund for Environmental Protection and Water Management in Warsaw** of a total of **21.9 mln**



WFOŚiGW
w Łodzi

We received financial support and counselling from **Regional Fund for Environmental Protection and Water Management in Lodz** at MUL thermo-modernisation projects of a total of **1.49 mln**



Professional economic analysis of our infrastructure energy efficiency was provide by **National Energy Conservation Agency**



MUL is a co-organiser in Nature of Health



Thermo-modernisation of Collegium Anatomicum, a building of historical value, was co-funded by European Regional Development Fund and was worth a total of **2.3 mln**

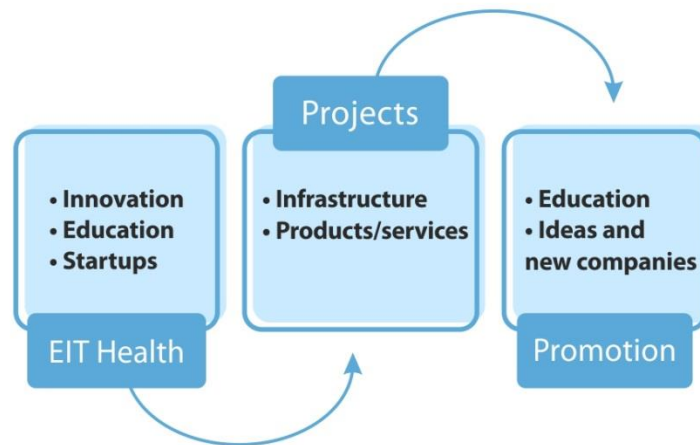
Together we can better protect our environment

ECOUMED AND INTERNATIONAL INITIATIVES

- ▶ EcoUmed project will be closely related to research, education and business initiatives
- ▶ MUL is a partner of numerous research platforms which bring together key partners from a variety of sectors
- ▶ EIT Health is a key cooperation platform in active lifestyle and healthy ageing

By 2022 EcoUMED will be a crucial element in cooperation, good practice exchange and joint projects in: sustainable infrastructure R+B based on top European standards (UK, Benelux, France, Spain), educational activities to raise the awareness of EU citizens of the climate change and its impact on human health management and innovation projects which involve new technologies in medicine

- ▶ Additionally, EcoUmed intends to promote cooperation with startup accelerators which affect development of products and services in health care, future foods, energy and climate.



ECOUMED FUTURE PROJECTS

ECOUMED HEALTH ACADEMY PROJECT

/Re. Activities 1,2,3,4,5,6,7,8,9,10,11,12,15/



As part of **Expo Horticultural 2014 Lodz, Poland**, MUL will implement **EcoUmed Health Academy** project within CKD and MUL premises.

Health Academy will focus on prophylaxis, education and prevention of modern-age diseases by interdisciplinary scientific research carried out by certain university units and by popularising research in the green area of CKD Campus.

The project assumptions include investment in the construction of 12 energy-efficient, interdisciplinary research and laboratory modules with an integrated infrastructure which will use the natural value of the environment and undeveloped parts of CKD Green Campus. The project also involves the purchase of IT platform for diagnostic data monitoring and archiving as well as a mobile application for location and moderation of EcoUMED Health Academy functioning.



The research will apply innovative IT solutions to be implemented in the fields of prophylaxis and health promotion in order to enhance health self-awareness and self-control. The project also involves creation and tests of new technological solutions which will facilitate new diagnostic and compensation methods in functional limitations, including mobility and perception impairment, as well as methods of rehabilitation and prevention.

In addition, the project entails formation and testing of new IT diagnostic methods based on artificial intelligence and computer simulation at a varied degree of advancement to manage epidemiological data on chronic diseases.

ECOUMED FUTURE PROJECTS

CKD GREEN CAMPUS /Re. Activities 1,4,5,6,7,8,9,10,11,12/



Now CKD Campus is composed of:

- 12 research and didactic units
- 12 hospital clinics
- 2 diagnostic departments
- 407 beds for Central Clinical Hospital patients

In 2017 Central Clinical Hospital provided:

- 330 500 consultations
- 39 000 hospitalisations
- 120 000 specialist diagnostic procedures

By 2023 Green Campus will be attended by
about 13 000 – 14 000 people

Project Outline:

Medical University Green Campus is planned to include design and construction of:

- Friendly surroundings as well as Campus functional and spatial concept in accordance with coherent urban planning
- thorough thermo-modernisation of selected CKD buildings (thermal insulation of the walls and roofs, replacement of windows and doors with their 'warm' equivalents, replacement of electric, ventilation, air conditioning and heating installations)
- modern on-site transport system and multi-storey car parks in designated zones
- intelligent transportation supported by autonomous cars, construction of cycle and pedestrian paths
- zones for relaxation, green areas for rest, wooneerfs
- system and infrastructure for selective waste management
- solutions to improve water and sewage management
- modern indoor lighting and LED outdoor lighting system on the Campus
- undeveloped CKD areas revitalisation for initiatives and investments by MUL strategy
- central heating system replacement and modernisation of heat substations
- renewable sources of energy in selected CKD Campus buildings
- wall screens and sensors for monitoring smog and air pollution levels
- central Building Management System for monitoring and management of the media in MUL buildings

• Total usable area of buildings situated
on the CKD campus – **177 575 m²**

• Annual electricity consumption
in existing buildings – **7 496 210 kWh**

• Current annual water use:
– **66 326 m³**

• Intended usable area
to be created: – **65 000 m²**

• Thermal energy consumption
in the existing buildings: – **48 062 GJ**

COMPLEX THERMO-MODERNISATION OF MUL SPORTS CENTRE AND HALL OF RESIDENCE No 3 /Re. Activities 13,4,5,6,7/

The enterprise consists of complex thermo-modernisation and construction of a power system based on renewable energy sources in two MUL units:



Student House Elevation No. 3

- Hall of Residence No 3
- Sports Centre

The project includes:

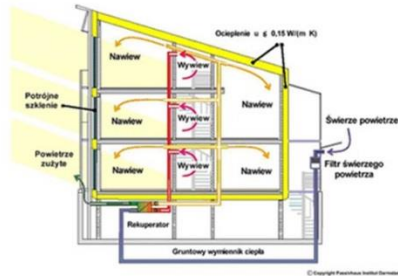
- thermal insulation of external walls
- modernisation of hot water installation
- aluminium windows and external doors replacement
- heating system modernisation
- installation of mechanical supply and exhaust ventilation with heat recovery (min 70% heat recovery efficiency)
- installation of BMS for energy and media management
- photovoltaic installation on roofs and external walls

The projected activities will allow to decrease the building energy consumption, which will reduce the operating costs and the media costs. The thermo-modernisation project has been designed on the basis of energy audits.

The implementation of the project will reduce heat loss and energy demand in public buildings, decrease harmful gases emission and control negative influence on the natural environment and local inhabitants' health.

MOlecoLAB: LABORATORY, RESEARCH AND DIDACTIC PASSIVE BUILDING

/Re. Activities 1,2,3,5,6,7,8,9,10,11,12,14/



The project involves the first in our country construction of entirely passive design for laboratory, research and didactic purposes: MOlecoLAB (building A6 at Pomorska 251), with RES installations and highly specialised equipment of high energy saving parameters

Passive design will involve the following construction solutions:

- ¼ building shape orientation for maximum energy gain
- ¼ high window to wall area ratio in the south
- ¼ high-performance insulation of internal partitions and window woodwork
- ¼ thermal bridges reduction
- ¼ high-performance ventilation with heat recovery
- ¼ high-efficiency and energy-saving laboratory equipment
- ¼ reversible heat pump
- ¼ energy-saving LED lighting
- ¼ solar panels for hot water system
- ¼ photovoltaic panels

The projected building will be equipped with high tech constructions and installations including renewable energy sources which will contribute to reduction in public building energy consumption and demand (from 120 kWh/m²/year to about 15 kWh/m²/year).

The project assumptions result from MUL environmental policy and have been designed in response to technical requirements regarding energy efficiency of public buildings after the year 2021.

SWOT ANALYSIS



STRENGTHS:

- 1) Innovation-oriented employees at research and managerial levels
- 2) Experience for future similar investments
- 3) MUL financial liquidity
- 4) University's own base and space for solutions to eco-investments
- 5) Higher University status
- 6) University activities at regional, national and international levels
- 7) MUL: the only medical university in Lodz region

WEAKNESSES :

- 1) Dated infrastructure which is incompliant with current regulations and generates high operating costs
- 2) Increased expenditure on modern ecological solutions and technologies
- 3) Disintegrated MUL infrastructure which is scattered around the whole town
- 4) University dependence on one thermal energy supplier
- 5) Prioritization of MUL environmental activities
- 6) Lack of standards of ecological and energy efficient construction in MUL

OPPORTUNITIES:

- 1) Reduction in operational costs and CO₂ emission
- 2) Improved education standard and university image
- 3) Appearance of new technologies and ecological solutions
- 4) New external funding sources
- 5) New cooperation opportunities
- 6) EU policy in environmental activities
- 7) Epidemiology and ecology of Lodz region (smog, air pollution)

THREATS:

- 1) Complicated processes of construction investments (complex Construction Law and fire regulations)
- 2) Legal and geographical conditions for environmental activities
- 3) Changes in national environmental policy
- 4) No opportunities of external co-funding
- 5) Unreliable stock-taking reports and energy audit reports
- 6) Changes in economic situation in domestic and global economy
- 7) Social resistance to infrastructural changes and to temporary relocation for the purpose of new project implementation

PROGRAM SCHEDULE



REALISATION/IMPLEMENTATION PERIOD	2018				2019				2020				2021				2022			
	1 st quarter	2 nd quarter	3 rd quarter	4 th quarter	1 st quarter	2 nd quarter	3 rd quarter	4 th quarter	1 st quarter	2 nd quarter	3 rd quarter	4 th quarter	1 st quarter	2 nd quarter	3 rd quarter	4 th quarter	1 st quarter	2 nd quarter	3 rd quarter	4 th quarter
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