

For Global Growth and Competitiveness

CoCoSi - „Competence Centres of Slovenia“

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CC-SURE, Head of Competence Center



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA IZOBRAŽEVANJE,
ZNANOST IN ŠPORT

Slovenian-Hungarian Innovation Forum
29 May 2013, Budapest

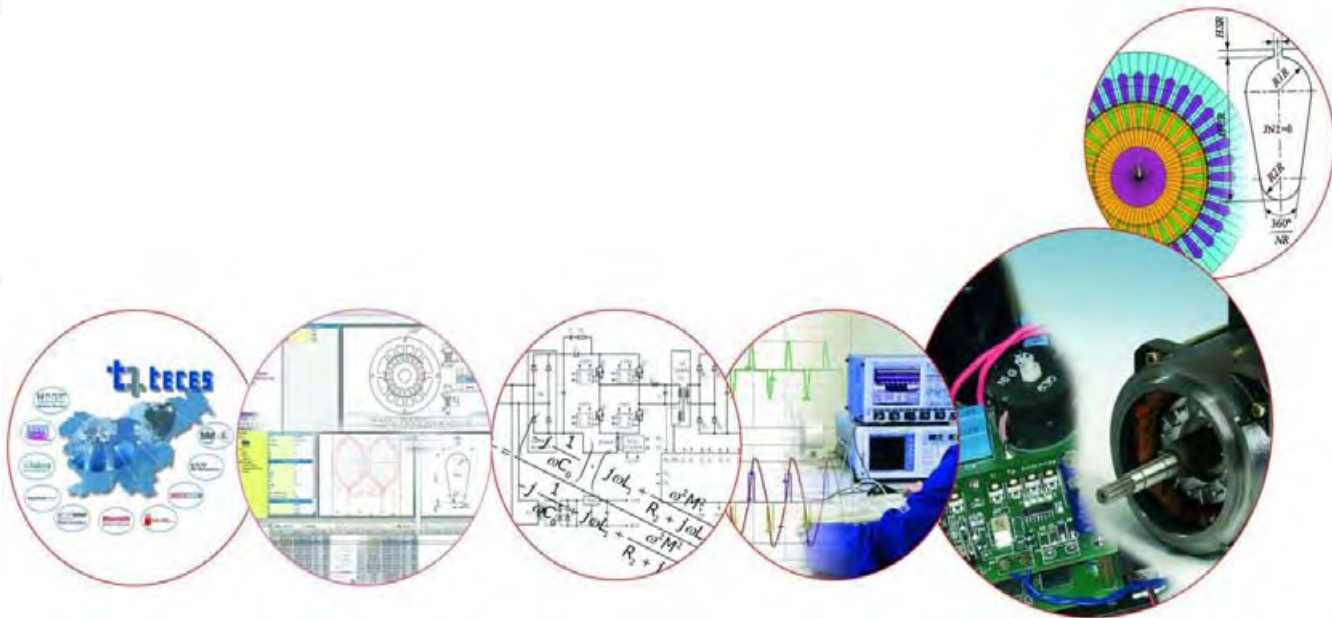


Investing in your future
OPERATION PART FINANCED BY THE EUROPEAN UNION
European Regional Development Fund



TECES

**Research and Development centre for
Electric Machines**



About TECES

TECES connects worldwide established Slovene companies and education and research institutions active in the field of **electric drives and power electronics**.

It was founded in the year 2001 as the joint goal of its founders, which was the establishment of an efficient system of linking companies and research institutions in order to strengthen the competitiveness of the Slovenian industry.

Founders

- **8 companies** (Bartec Varnost d.o.o., BSH Hišni aparati d.o.o., Domel d.d., Hidria Perles d.o.o., Hidria Rotomatika d.o.o., Indramat elektromotorji d.o.o., Iskra Avtoelektrika d.d., Kolektor Group d.o.o.),
- **2 faculties** (UM FERi, UL FE)

Status

- legal: private entity
- financial: non-profit organization
- business status: research & development organization
- registered in the SRA: 1792-001 Research and Development Group TECES
- Primary activity: 72.190 Research and development on natural sciences and engineering

TECES as a R&D institution primarily covers the field of research and development.

Role of TECES has changed during time, according to the needs and demands of the market

- **a mediator** (linking and unifying the industry and the educational and development sphere in Slovenia active in the field of electric drive systems).
- **a coordinator** (strengthening of the supporting environment that ensures the execution, implementation, coordination and administrative/financial support of all own and joint projects of partners.)
- **a knowledge institution** (research organization with its own R&D infrastructure and know-how which further provides the interest group support for the development of market interesting products).



Key Research Fields / Competences / Services

Key Research Fields / Competences

- **broader theme:** energy efficiency, use of alternative energy sources, energy conversion
- **narrower theme:** power converters, power electronics, electric drives (electric machines, electronics), motor control, mechatronics

Services

- Field of Research and Development of new products
 - **Research and Development Services**
 - new innovative concepts of **electrical machines**, **actuators** and **mechatronic assemblies**,
 - innovative concepts of **power converters**,
 - **electric machines control algorithms**,
 - **thermal and mechanical optimisation of electrotechnical devices** and mechanical and thermodynamic **design of enclosures and housings**.
 - **support** the introduction of newly developed solutions (prototypes) into manufacturing.
- Field of Project Office
 - **Project Office Support**
 - management, coordination of joint and multiple projects partners,
 - counseling, support and preparation of project application forms for R&D and investment projects, administrative and information support of project implementation and coordination;
 - **Organization** and implementation of training events (workshops, seminars, lectures,;
 - **Linking with other institutions** (Technological Centres, Centers of Excellence, Competence Centres, ...)



Active innovation mechanisms in SLO

Centers of Excellence (CoE)

Basic Research

100% public funding
R&D activities, Infrastructure
R&D lead by PRO/Ph.D.
Legal entity
Staff employed in center
4 years
10 centers
100 mio €

Competence Centers (CoC)

Early Hi-Tech products

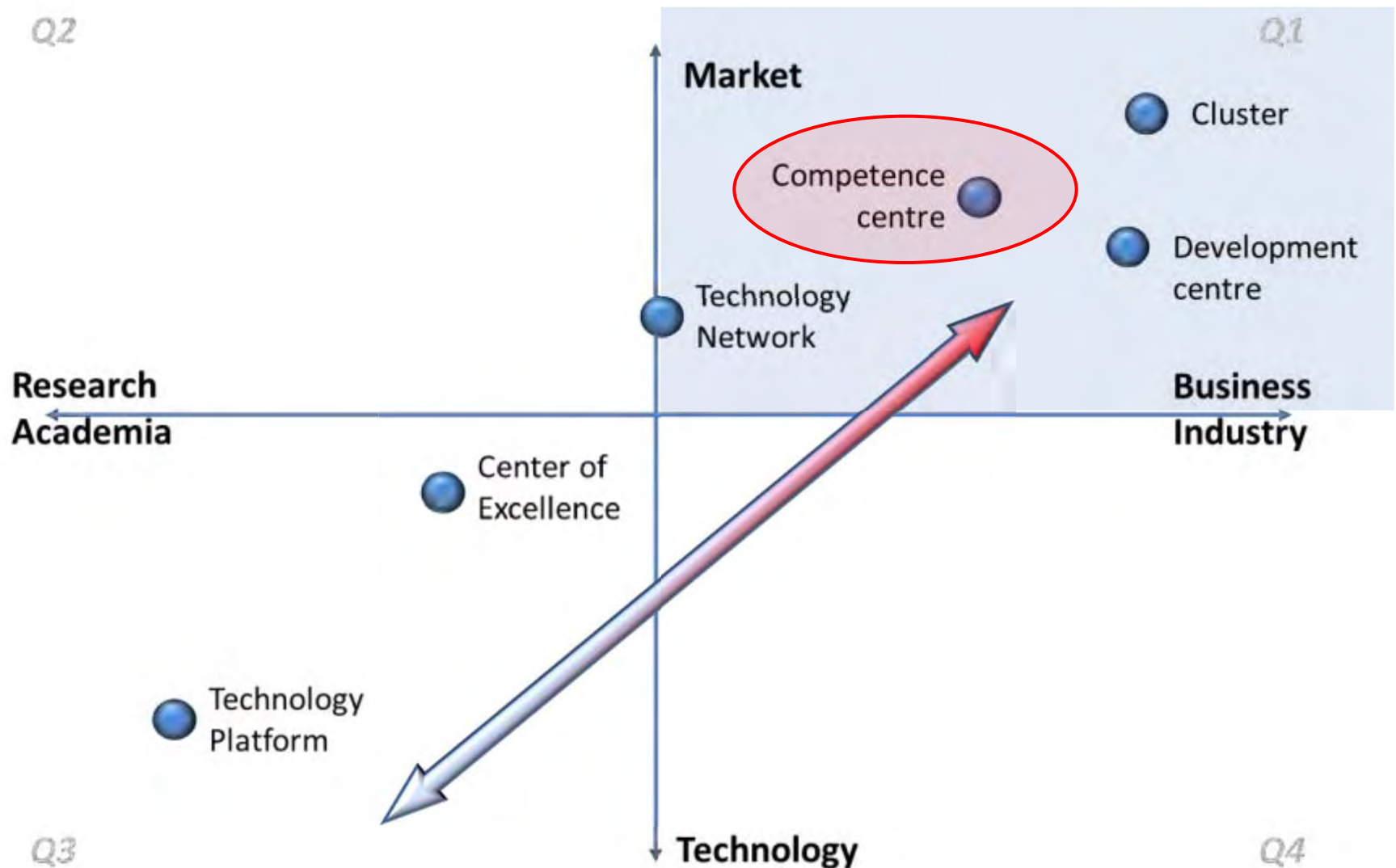
~65% public funding
100% R&D activities
R&D lead by companies
Not legal entity (consortium)
Staff employed at partners
3 years
7 centers
43 mio €

Development Centers (RC)

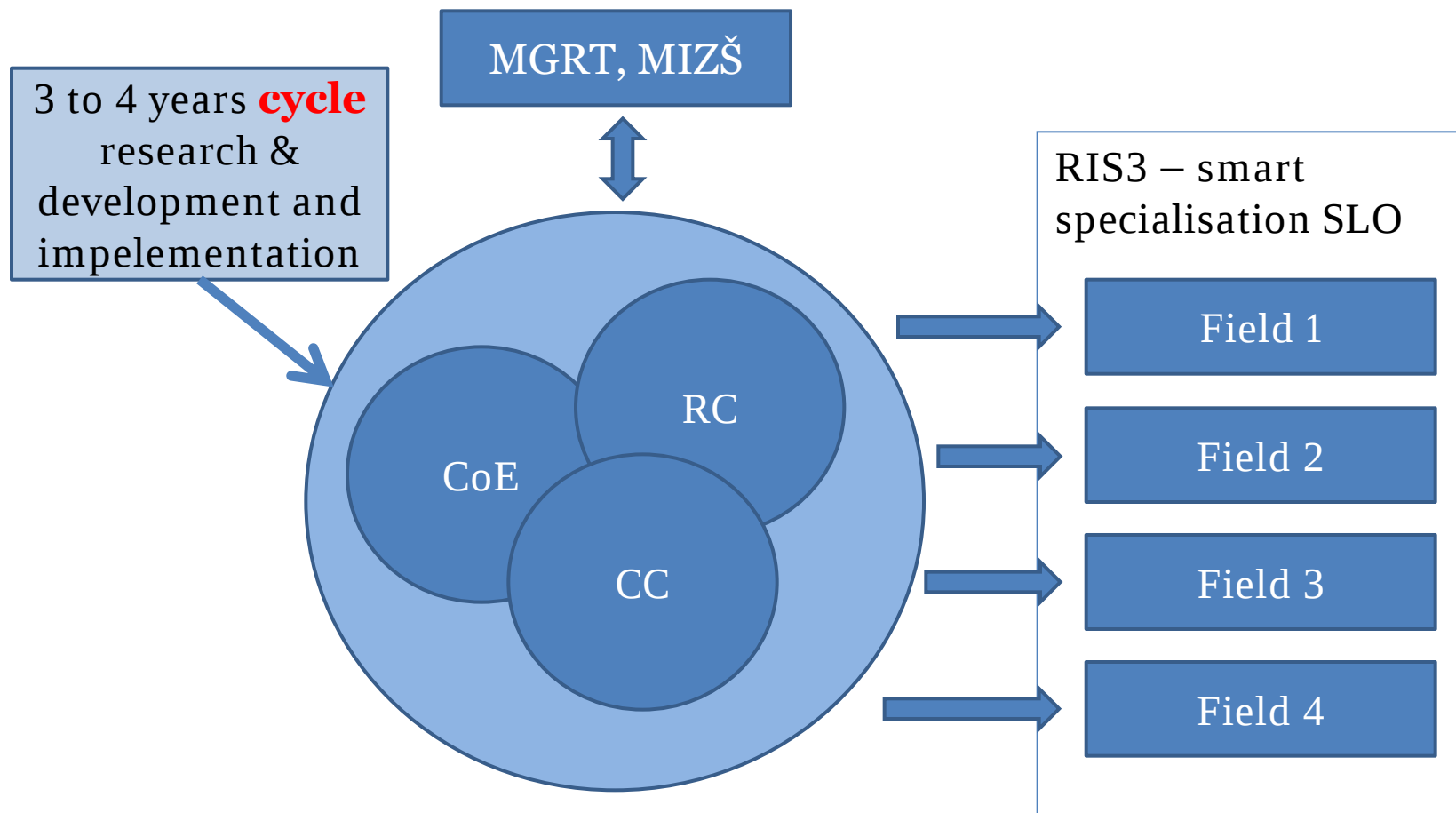
Infrastructure

~40% public funding,
R&D activities, Infrastructure
R&D lead by companies
Legal entity
Staff employed in center
4 years
17 centers
180 mio €

The role of competence centres



Active innovation mechanisms in SLO



Building competences for global market ...



CC BME – Biomedical technology, health and knowledge about life



CC STV – Advanced control technologies



CC BRIN – Biotechnology development and innovations, food and health



CC SURE – Efficient use of electric energy



CC CLASS - Cloud computing technologies with services



CC TIGR – Sustainable and innovative construction technologies



CC OPCOMM – Internet of things and open communication platform for integrated services



Vision

A mechanism (tool) for creating high added value
in the form of new products, solutions and
bussiness models based on high technologies and
global selling of products, jointly developed by two
or more partners.

... basic elements of growth...

Number of organizations

** **55 companies** and
33 institutions*

Number of common projects

58 projects

Number of reserach hours

over 1.200 FTE

Number of researchers

over 300



** Above average export, added value and R&D*

... and for achieving results and goals!

Number of innovations and patents

188

***New products* and services**

152

Private investments

over 20 mio €

**New technology, process and
organization solutions**

19

Product Reviews



The competence centre mission

- Development and **strengthening of competences** of *Slovenian economy* on priority areas (7)
- Development and use of **non-technology** competences (the „*we know, we have but we don't sell*“ syndrome)
- We work for partners so that they have **better operational results**
- Long-term partner support for **development of key branches** (7) together with the government and other stakeholders

Just because you have
the tool,
you are not necessarily
competitive.

Main characteristics of the competence centres, intersection of economy and science

- Mixed team concept (users + company employees and public research organizations - PRO)
- „Pull“ effect of the market and its needs (inclusion of the best PRO <- information on the market)
- Bridging the Death Valley: **process linking** (TR) AR – from the right: market - development = concept **defines a common goal**
- Transfer of knowledge into use according to the football model: interactive cooperation of all players



Competence centre today and tomorrow

- Faster **introduction of new products to the market**, especially since the partners are too „small“ themselves
- Achieving **repeatability of sales**
- Partner cooperation -> strengthening of competence centres = 7 **priority areas** = smart specialization
- Connections **inbetween competence centres** with contents/technology integration -> „cross-selling“
- Development **of new business models**



Direction: synergy with the State

Cooperation and **realization** of national development goals

- Co-designing policies for transfer and use of knowledge in the economy = **commercialization**
- Co-designing of **development strategies** (7 areas) + **smart specialization**
- **Public-Private-Partnership concept** (PPP) so areas of social change - SC (Societal Challenges)
- **Connecting ministries** (MIZŠ, MGRT, MZZ) and SPIRIT (TIA, JAPTİ and STO) and GZS



National development goals until 2020

- **General -> export of products:**
 - New jobs
 - Growth of GDP and competitiveness
 - Higher added value
- **Specific, a basis for pilot solutions and demo solutions, such as:**
 - Broadband access for everyone
 - 20% reduction of energy use
 - 10% reduction of CO2 emissions
 - Social inclusion of older generations
 - Other, based on results



Horizon 2020

- **Implementation mechanism** for projects from 2014 to 2020, including international projects
- CC as a response for **better disbursement of EU funds**, impetus for the economy and commercialization
- Additional investments from **private financial resources**
- **Global recognisability** of Slovenian industry in the specified fields
- CC as a Horizon 2020 connection **between the EU and non-EU countries** for the purpose of common lobbying



... to summarise!

- CC is not a goal, but a **tool**
- Pilot and demonstration projects with which we **implement** development strategy and **achieve** the country's development goals, as a basis for **business effects**
- CC **realize** and „export“ (replicate on the market) reference pilot and demo solutions
- Spreading of „membership“ and strengthening of CC as **internationally recognisable centres** and strengthening of Slovenia as a trademark (7)



Why are we here with you today?

Cooperation

- Constant flow of information
- Partner representation

What do we search on foreign markets?

- Similar centres abroad
- Contracts for projects abroad
- Events/fairs related to our fields

What do we offer foreign markets?

- Solution demonstration (visits)
- Solution transfer (pilots/demo) abroad
- Counselling and competences



Presentation of the competence centres ...



CC BME

Biomedical technology, health
and knowledge about life



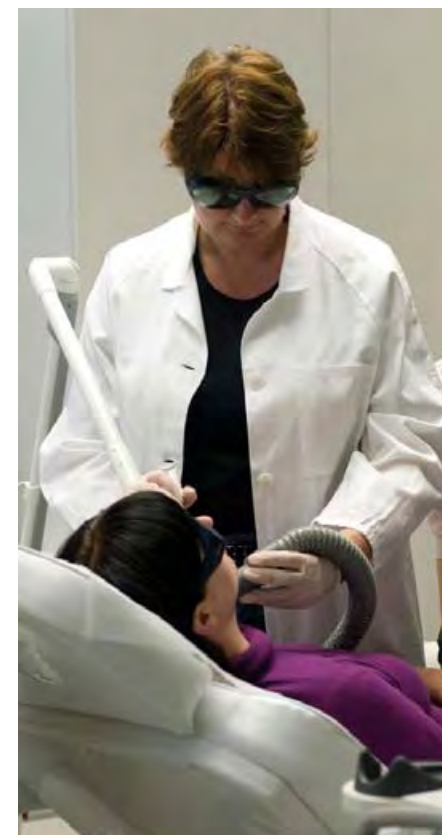
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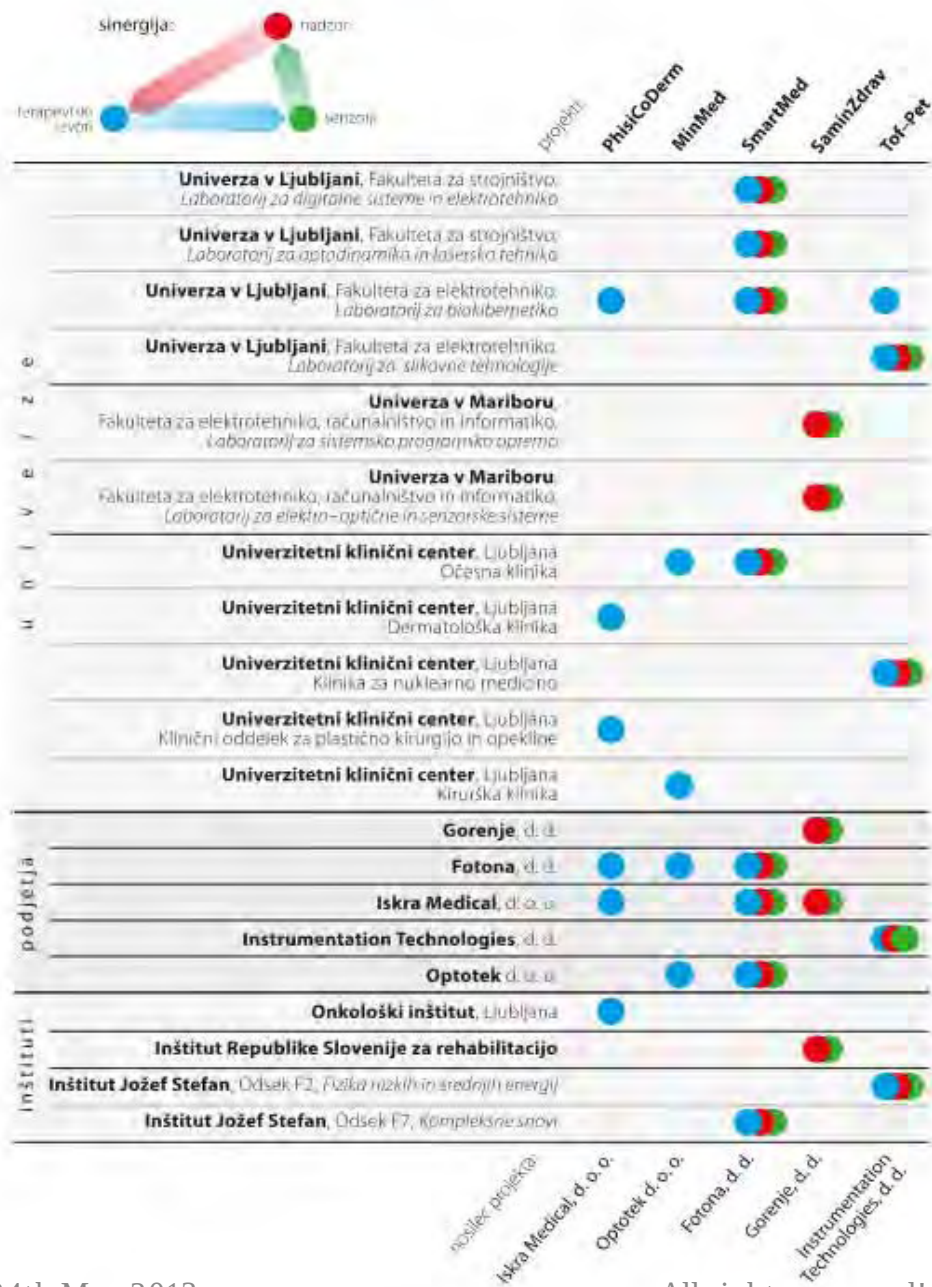
To position Slovenia as the incubator of innovative companies with advanced biomedical equipment in the world.

Programme

Research and development of products and applications designed to reduce the invasiveness of medical interventions and to increase the reliability and accuracy of diagnosis

Technical development with the preclinical and clinical studies that define the parameters of the new application and more effective and safer medical protocols





CC BME

- 5 projects
- 12 consortium partners
- more than 120 researchers

Expected results:

- 50 innovations
- 15 patents
- 17 new products
- more R&D investments
- new investments



CC BRIN

Biotechnological development
and innovations



Development of knowledge and innovative technologies



New biotechnological processes in product development

Clinically proven new products



Univerza
v Ljubljani Biotehniška
fakulteta

Establishing systems for the quality control of new products



Development of new systems biology approaches





Probiotics



Functional Food
and Dietary
Supplements



Active
Pharmaceutical
Ingredients in
Medicine and
Veterinary Medicine





CC CLASS

Cloud computing technologies
with services

KC Class – cloud computing center

Developing knowledge and interfaces for infrastructure as a service, platform as a service, software as a service, Sustainable Growth and Quality of Life Support, E-Learning Services in the Cloud, Cost-efficient Vertical Integration of Logistics, E-Health and Environmental Services in the Cloud



World in Clouds – where the road takes us in Europe - <http://prezi.com/dgk9-1s6iur-/implementation-of-the-cloud-computing-strategy/>

Is ... For all companies? ?
Indispensible

What changed...?
IT Management

Is there an IT company, which does not have a cloud offering?

If no, it won't be there in the future

Base for...? IT in the future

enabled ... Business agility

Creates new working places

Cloud Computing –

upto 2016: more than 50% data will be stored there,, 90% of applications will come from there, 75% companies will use sensitive data from the cloud => cloud=internet – Source: Cisco cloud report 2012

It is ... New innovation force within all industries

New IT is coming, where you do not buy software and hardware

... Blessing? Yes, for smaller companies

It is beginning ...?
Industrialization of IT, turning complexity into simplicity
I buy as much as I need, and when not? – I just turn off usage

...global phenomenon, where you do not own anything else but your data – sounds familiar?

...if offers endless new business opportunities

... it is not new technologies, it is more about new business models, based on Opex, not Capex

and ... It creates new risks? challenges

...on the market it exists for a long time already
-Twitter, Google, Dropbox, Skype, LinkedIn...



IaaS – Infrastructure as a service



SaaS – Developing software as a service components

Paas – Development support for cloud computing



24th May 2013

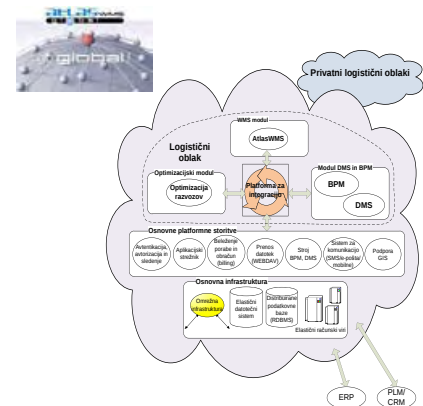
Learning cloud service from the cloud



Health and environment cloud services.



Advanced, cloud-based applications, CRM and PLM





opcomm



living bits and things

KC OpComm

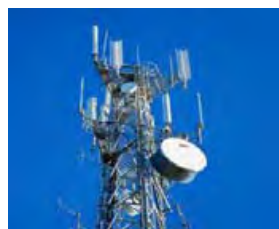
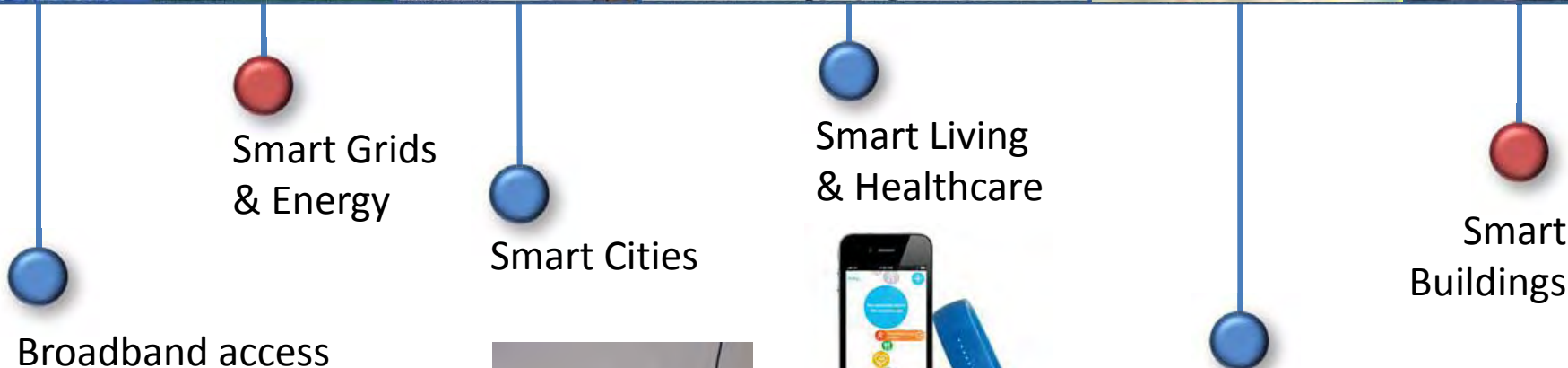
Internet of things and open communication
platform for integrated services



Technologies to manage „big data“ and millions of connected devices as the next wave of the Internet development. Known as Internet of Things (IoT) and Machine to Machine (M2M) they include sensors, sensor networks around us, collecting data and advanced analysis of data, addressing also safety, privacy and visualisation.

We provide common IoT platform Occapi™ which is used for development of new products, services and applications for smart solutions in different industries.







KC STV

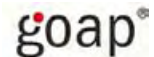
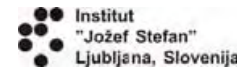
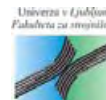
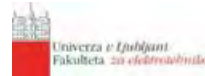
Advanced control technologies

Knowledge, tools and building blocks in the area of control technology (automation and informatics)



The biggest research and development project of Technology Network - Process Control Technology.

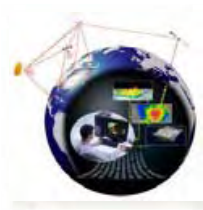
Partners (17) - the most prominent Slovenian engineering companies and academic institutions, with some end-user production companies



Innovative environment

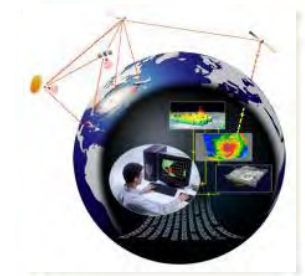
Pooled research and development in:

- Core control technologies – algorithms, tools and building blocks for control systems, and
- Different problem domains:
 - Technology of web-based, remote and distributed control
 - Model-based production control
 - Optimisation and control for efficient energy consumption and clean environment
 - Automatic condition monitoring of process equipment
 - Efficient fusion power-plant control system



(Some) Solutions

- Software tool for rapid prototyping and implementation of advanced control methods
 - speeds-up the implementation and tuning of advanced control algorithms and improves the process performance
- Batch process control tool
 - has several unique features such as batch server execution on standard PLC equipment
- Production control tool
 - improved production control relying on model-based control concept
- Diagnostic centre for automatic condition monitoring of process equipment
 - implements the prognostic and health management (PHM) systems to reduce the costs of machine maintenance



(Some) Solutions

- Optimisation of HVAC systems in buildings
 - optimising different heat sources and cold production system using room occupancy information
- Optimised electricity production from renewable energy sources
 - control solution maximises gas and electricity production while preventing anaerobic digester failure due to acidification.
- Smart-grid interface for smaller industrial and larger residential environments
 - supports electricity demand response services for trading and reducing electricity costs
- Terminal unit for remote process control and supervision
 - SW solutions enable the integration of the unit into public and private web portals and social networks
- Modbus TCP IP Driver
 - for any popular operating system and equipped with additional features speeding up time to market of customers



International networking and cooperation

- Cooperation in R& D projects
- Joint – development projects
- Joint pilot and demonstration projects
- Introduction of (jointly) developed solutions to the market



KC TIGR

Sustainable and innovative
construction technologies

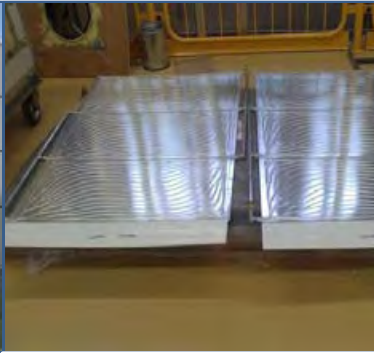
Development of knowledge in renewable energy sources, new materials, recycling, new concepts, technologies and construction processes with a support of advanced information-communication technologies.

Improving the visibility and the importance of the industry and contributing to both professional and public communities.





**TRIMO QBISS ONE
BIM TOOL**



**FOTOVOLTAIC
HEATING MODULES**



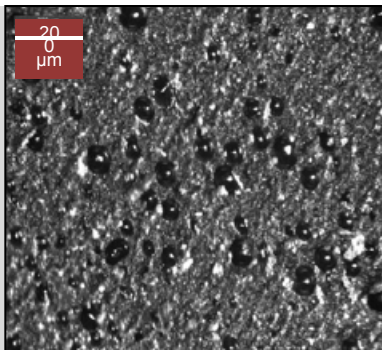
**FLOOR CONVECTION
UNIT**



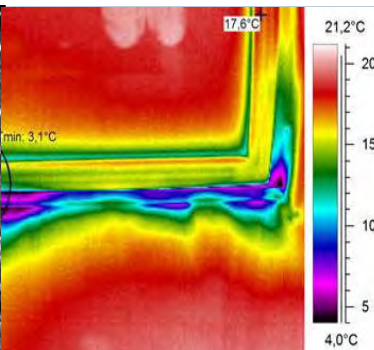
**FIRE PROTECTION
FLAPS**



**COMPACT SYSTEM
FOR THE COLLECTION
AND TREATMENT OF
WASTE WATER**



**POLYSULFIDE WITH
REDUCED THERMAL
CONDUCTIVITY**



3MONT SYSTEM



**SPECTRALLY SELECTIVE
PAINT COATINGS FOR
A SOLAR THERMICS**



**WOOD COATINGS
WITH HIGH
RESISTANCE TO
CLIMATE
INFLUENCES**



**THINNABLE FIRE
COAT**



KC SURE

Efficient use of electric energy



KC SURE

KOMPETENČNI CENTER

Napredni sistemi učinkovite rabe električne energije

COMPETENCE CENTER

Advanced Systems of Efficient Use of Electrical Energy



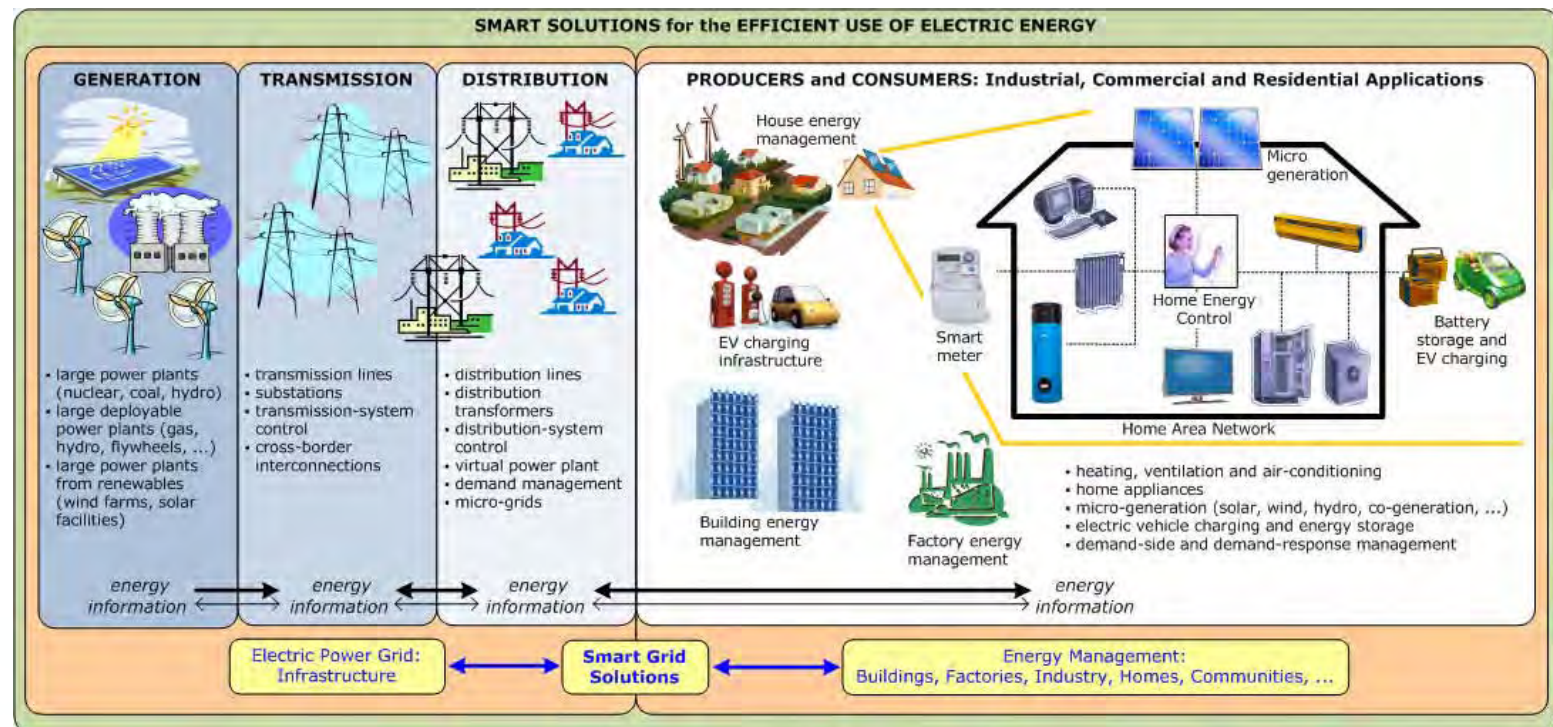
Naložba v vašo prihodnost
OPERACIJSKI PROGRAM IZOBRAŽEVANJE
in šport (OPIS) za regionalni razvoj



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA IZOBRAŽEVANJE,
ZNANOST, KULTURO IN ŠPORT

The long-term objective of CC-SURE is to become one of the key international and intersectoral actors in the field of **efficient electric energy conversion** compliant with **the smart-grid evolution process**.

The partners associated in CC-SURE represent key actors in the whole chain of production, distribution and use of electric energy. The networking process results in energy efficient products and services for the global market.





Competence Center Advanced Systems of Efficient Use of Electrical Energy
COMPETENCES



Energy Management & Smart Technologies

Efficient Use of Energy, Virtual Power Plant,
Integration of Renewables, Prosumers, DR, DSM, ...

Information Communication Technologies

Metering, Automation & Control Systems, ICT
Infrastructure Performance Testing, ICT Monitoring &
Management, Data Management & Analytics, ...



Networking / Management

New Business Models, New Products & Services,
Innovation & IP Management, Sales, Global Market
Players, Project Management & Coordination, ...



Electric Power Systems

Generation & Transmission & Distribution, Distributed
Generation (Solar & Wind & Cogeneration, ...),
Control & Protection, Consumption, ...



Industrial and Commercial Systems

Farming, Mining, Oil & Gas, Chemical, Pharmaceutical,
Steel & Aluminum Production, Automotive OEMs,
Industrial HVAC-R, EV Car Parks, Energy Services, ...



Home Appliances and Systems

Home Automation, Professional & Household Use,
Cooking, Laundry, Dishwashing, Refrigeration, Power
Tools, HVAC Systems, Photovoltaics, Heat Pumps, ...



Electric Drives & Actuators

Electric Machines & Drives Applications: Pumps,
Compressors, Fans, ... **Components:** Windings,
Commutators, Laminations, Die-Cast Parts, ...



Electronic & Power Electronic Systems

Power Electronics: Inverters, Rectifiers, Converters,
Electronics: Control Boards, Communication
Interfaces, Gateways, ...



Electric Devices & Components

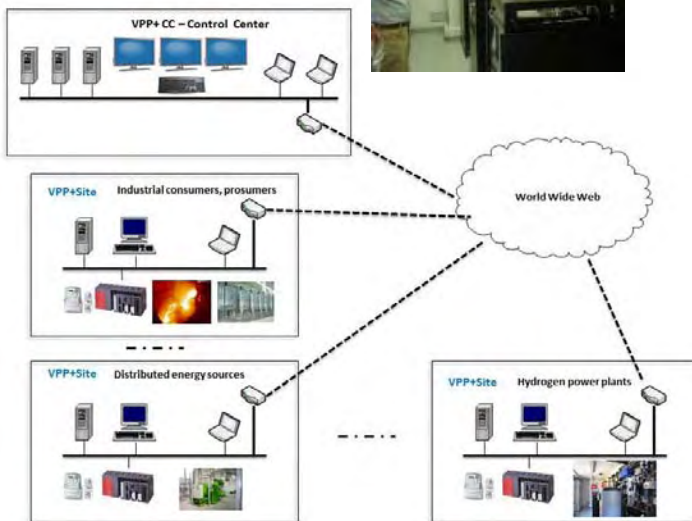
Measurement Devices & Instruments, Sensors,
Switchgears, Fuses, Transformers, Contactors, Circuit
Breakers, Protection Devices, ...



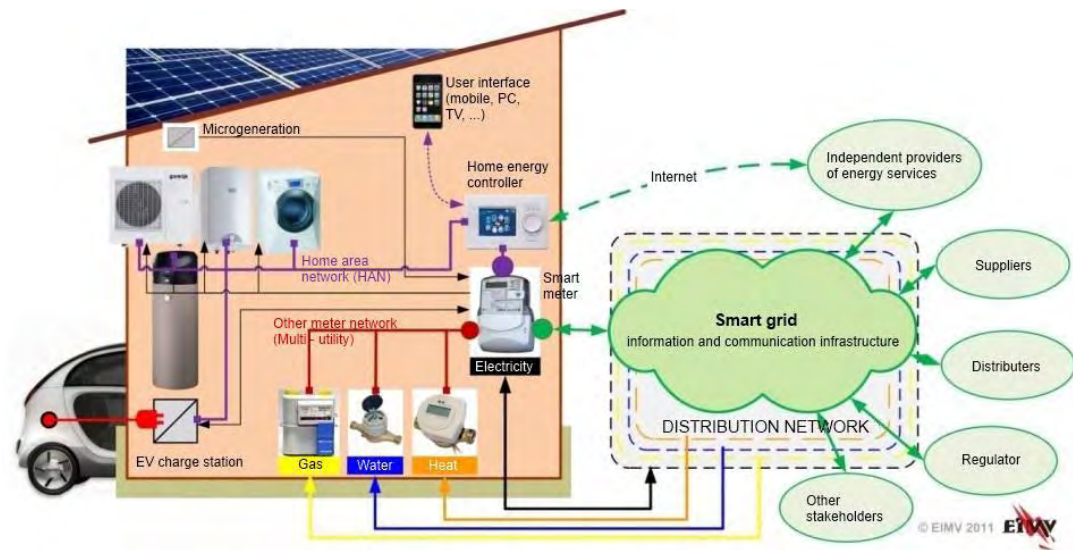
Research / Development / Measurement / Prototyping / Testing & Validation / Engineering / Small & Large Scale Production

Smart & Efficient Solutions

- Virtual Power Plant
VPP+



- iGorenje system
connected through HAN
(Home Area Network) and
SmartGrid technology



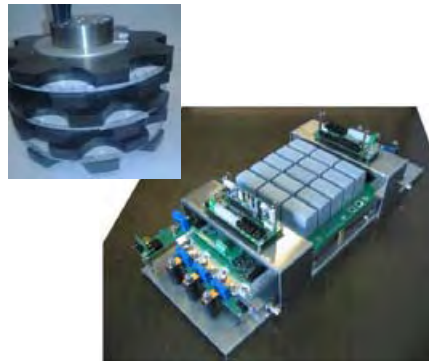
- Smart Grids
Implementation Plan
for Slovenian
Distribution Networks

Smart & Efficient Solutions

- Power quality analyser
PowerQ4 Smart



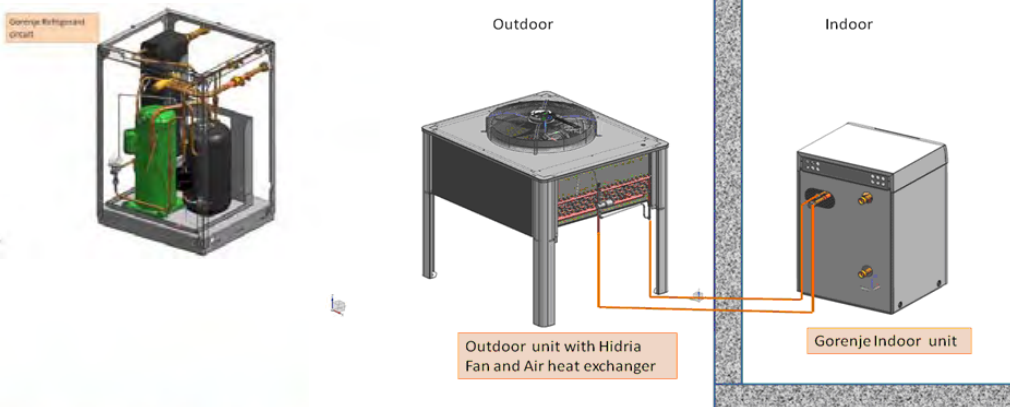
- Four-quadrant TFM
drive system



- Supervisory control
system for power
transformers NSET



- Heat pump air-to-water



- A new line of energy-
efficient washing
machines



Abbreviation	Name	CEO	e-mail
CC BME	Biomedicinska tehnika, zdravje in znanost o življenju	Zore LUKIN	zore.lukin@fotona.com
CC BRIN	Biotehnološki razvoj in inovacije, hrana in zdravje	Iris PODOBNIK	Iris.Podobnik@kc-brin.si
CC CLASS	Storitve podprte z računalništvom v oblaku	Dalibor BAŠKOVČ	zeleno@siol.net
<u>CC OPCOMM</u>	Internet stvari in odprta komunikacijska platforma za integracijo storitev	Tomaž VIDONJA	tomaz.vidonja@ict-slovenia.net
<u>CC STV</u>	Procesne in sodobne tehnologije vodenja	Zoran MARINŠEK	Zoran.Marinsek@inea.si
CC SURE	Napredni sistemi učinkovite rabe električne energije	Matej GAJZER	matej.gajzer@teces.si
CC TIGR	Trajnostno in inovativno gradbeništvo	Tanja MOHORIČ	tanja.mohoric@hidria.com



What has not
been told and you
would like to ask?

info@sure.si