EUREMnext

TAKING EUROPEAN ENERGY MANAGERS TO NEXT EFFICIENCY LEVELS BY IMPLEMENTING ENERGY AUDIT RECOMMENDATIONS

The EUREMnext project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 785032.

EUREM next
European EnergyManager

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FOREWORD

Dr.-Engineer Robert Schmidt
Speaker of EUREM Community
Nuremberg Chamber of Commerce and Industry

Climate change is advancing to become one of the greatest challenges facing humanity. How can we manage to reduce global warming by the middle of the century? This question has been intensively discussed by the international community for years. Finally the international climate protection agreement was adopted in 2015 in Paris. The climate protection targets were raised further as part of the European Green Deal. According to this, in 2030 the amount of greenhouse gases is to be reduced by 55 – instead of previously by 40 – percent compared to the reference year 1990.

From an energy perspective, the answer is quite simple: Drastically cut back on fossil energy sources! More savings, more efficiency, more renewable energies! For years, the member states of the European Union (EU) have had directives on energy efficiency, energy services and renewable energies. Thus, the EU has entered a new era of energy and climate policy. Prior to this, the focus was on renewable energies, especially green electricity. It has become clear that the costs in this area are considerable and that the desired effect can only be achieved if we find a way to interrupt the trend of increasing energy consumption. Sustainable solutions, innovations and digitalisation can help here. A holistic energy policy cannot do without a strong efficiency approach.
The EU has recognised that a sustainable energy system can only be achieved if energy is used consciously and prudently. The EU Energy Efficiency Directive places particular emphasis on energy management. The introduction of energy management systems and energy audits for large energy consumers is expected to be a major leap forward for EU countries and also for European EnergyManagers (EUREMs).

This brochure introduces energy managers, among others, who are committed to making energy use as efficient as possible. Fortunately, there are already so many representatives responsible for energy efficiency in companies that only a small number of sample projects can be presented to the public. Nevertheless, we have much to gain from these good examples and their creators, because many of these projects can easily be multiplied ten- or hundredfold, since the respective solutions can also be implemented sensibly in other companies or areas. Although the results are quite impressive, we cannot afford to be satisfied with the level achieved. We still need many more of these smart ‚EnergyManagers' in our companies and in all other member states of the European Union and far beyond.

I am very glad that the EU supports the project EUREMnext. It aims to develop further training contents with modern methods and to extend EUREM to six additional European countries. Fortunately, the success of the EUREM model is also attracting great interest in other parts of the world. Energy management ‚made in Europe' already exists under the EUREM flag in South and Central America, Africa and Asia. The improvement of energy productivity is a task that represents a major, but also welcome challenge for the entire business community. However, energy efficiency, energy management or energy productivity cannot be imposed. To achieve these goals, we need people who take the lead, who know the way, who spot with a trained eye where energy is being wasted and who know how to intervene. On the one hand, it's about using the best available technology; on the other, it's about reducing unnecessary consumption. Our EnergyManagers are the army of energy efficiency. They do not burden the economy - they disburden it. They do not create costs, as they find solutions that pay for themselves in a short time. In this way, they help reduce costs, increase the competitiveness of the respective companies while contributing significantly to global climate protection. Our clear principle is therefore ‚Proud to Save':
We are proud of our EnergyManagers and their creative power, which is evident within the projects, and of the results we can present.
And: We do not want to rest on our laurels, as there is still a lot more to accomplish. The EUREM Training and the EUREM Network are one thing - proactive implementation in enterprises the other. Let's get to work persistently! Let's tackle it!

CONTENTS

EUREM

What makes EUREM a worldwide successful training and network programme for energy efficiency?

What is EUREM?

The European EnergyManager Training (EUREM) is an extra-occupational, practice-oriented and standardised training programme and a worldwide network for European EnergyManagers, provided in about 30 countries worldwide. There are now more than 6,000 qualified EnergyManagers who not only optimise energy efficiency in their companies, but also achieve cost savings and thus increase competitiveness in the long term, by also contributing to global climate protection. The qualification of employees as European EnergyManagers provides the company with know-how to continuously uncover energy weaknesses, to use savings potentials, to use renewable energies, to increase energy efficiency and to reduce the carbon footprint. The teaching units are held by experienced professionals. The training contents are standardised and therefore comparable worldwide. The knowledge acquired and the supporting „tools“ like checklists and calculation forms can be used immediately in operational practice. A key element of the training is the development of an energy concept. All participants have to tackle a current practical energy efficiency improvement in their companies or organisations. If the training participants work as energy consultants, they have to do this for one of their clients. The project work saves a company on average about 30,000 Euros per year in energy costs and contributes also to the reduction of greenhouse gases (on average 200 t/a). For this investment costs of about 100,000 Euros are necessary.

How did it begin?

The start of the training programme was in 1999, when the Nuremberg Chamber of Commerce and Industry (NCCI) launched the EUREM initiative and carried out first practical trainings “EnergyManager (CCI)” in Germany. Four years later, in 2003, the EnergyManager Training was introduced in the European Union, in the framework of an EU co-funded project, coordinated by NCCI and supported by the German-Portuguese Chamber of Commerce and Industry in Lisbon (DUAL), the Austrian Economic Chamber (WKÖ) in Vienna and the Energy Institute (EI) in London.

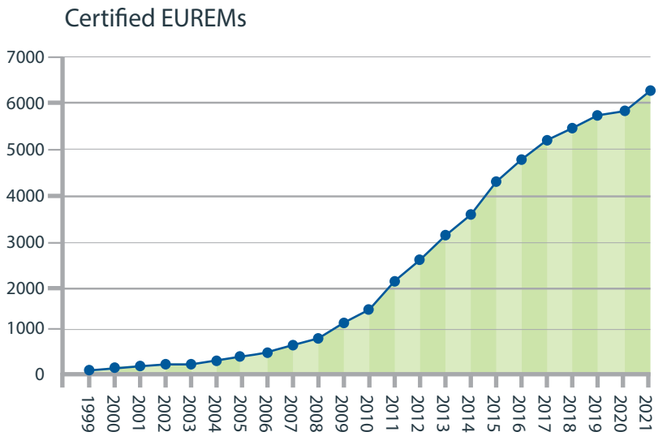
The follow-up project – `EUREM.NET - Training and Network of European Energy Managers´ – was implemented in nine further EU countries between 2006 and 2009. From 2013-2015 the project `EUREMplus – Boost Energy Efficiency in Manufacturing SMEs by Extending European EnergyManager Training and Network´– extended the worldwide network to six new countries: Bulgaria, Croatia, Cyprus, North Macedonia, Poland and Romania.

Within the EUREMnext project, the core idea was taken further. Find out more about the EUREMnext project on page 9.

EUREM WORLDWIDE

How does EUREM spread all over the world?

The EUREM training is expanding to all over the world. From India to Chile and from Finland to South Africa more and more partners join the energy expert network of EUREM. Up to 500 EnergyManagers annually are enrolling into the courses worldwide, so that the threshold of 6,000 European EnergyManagers is already exceeded.



EUREM states worldwide

This table shows all states, where the EUREM trainings are or were conducted. At the end of this brochure there is an overview of all active EUREM training providers incl. contact data.

	EUREM states	Active since
1	Albania	2018
2	Argentina	2011
3	Austria	2004
4	Belarus	2016
5	Belgium	2014
6	Bosnia and Herzegovina	2018
7	Brazil	2011
8	Bulgaria	2014
9	Chile	2011
10	China	2008 - 2014
11	Croatia	2014
12	Cyprus	2014
13	Czech Republic	2008
14	Egypt	2011
15	Estonia	2018
16	Finland	2008
17	France	2008 - 2013
18	Germany	1999
19	Greece	2008
20	Hungary	2011
21	India	2014
22	Italy	2009 - 2015
23	Latvia	2018
24	Mexico	2013
25	Moldova	2012
26	North Macedonia	2014
27	Poland	2008 - 2015
28	Portugal	2004 - 2013
29	Romania	2014 - 2015
30	Serbia	2018
31	Slovakia	2015
32	Slovenia	2008
33	South Africa	2014 - 2016
34	Spain	2008
35	Taiwan	2021
36	Turkey	2018
37	Ukraine	2017
38	United Kingdom (UK)	2004 - 2006
39	Uruguay	2011

THE EUROPEAN ENERGYMANAGER TRAINING (EUREM)

The target groups for the EnergyManager Training are technical experts and companies' executives as well as energy consultants. The training is usually held extra-occupational and consists of face-to-face training, online-learning and a final project work.

Face-to-face teaching

The EUREM European EnergManager Training is a training programme, which consists of approximately 160 face-to-face teaching units, that convey the theoretical background on relevant topics for EnergyManagers (technical and managerial aspects). They also provide the opportunity for exchange of knowledge and experience with the trainers and between the participants. The various teaching units are conducted by technical experts with a lot of field experience. Online resources for self-study and a final written test supplement these units. The EUREM training contents are standardised and therefore comparable worldwide. The quality of training and training organisation is ensured by periodical quality examinations by external auditors.

Final written test

From theory to practice: energy concept

Alongside face-to-face seminars, the energy concept (project work) is a compulsory element of the practical EUREM training. It covers 80 teaching units and is accompanied by highly qualified trainers (tutors). The energy efficiency projects include an analysis of the status quo of one specific weak point in the described company, a brief description of optimisation measures, the calculation of energy and cost saving potentials, the detection of the CO_2 reduction potential, as well as financial viability parameters, such as project investment costs and the estimated pay-back time. The company-specific energy concept is presented to an expert jury at the end of the course. After successfully completing these tasks the EUREM training participants receive the European EnergyManager certificate, which is generally awarded in a ceremonial act.

Project presentation

Excerpt from the training contents:

Engineering	Management
• Energy fundamentals • Energy requirement of buildings | energy efficient buildings • Heating engineering • Geothermal energy • Process heat | steam | heat recovery • Ventilation | air conditioning • Refrigeration technology • Compressed air • Lighting • Electrical engineering & -drives • Green IT • Process and load management • Energy storage • Monitoring and control systems • Cogeneration of heat and power • Solar technology • Energy from biomass • Wind energy • Energy efficiency & Industry 4.0	• Energy data management & load management • Energy audits • Economic calculation • Mobility management • Energy contracting • Project management • Energy purchasing | energy trade • Energy legislation | rules & standards • Climate protection management • Emissions trading

"Everything turned out to be useful - topics covered, materials shared, recommendations for finding additional information by lecturers, and as valuable were the contacts that were established between the course participants.

It is always important to find the right balance between sharing theory and practical examples. They were very well balanced on this course!"

Laire Suurväli, DHL Express Estonia AS

"I am very satisfied with the EUREM training programme because, in addition to comprehensive theoretical training, it also provides participants with practical training, which is very important for our further work in the field of energy efficiency improvement.

Through numerous practical examples, the lecturers simplified and approached the theory and gave us guidelines for comprehensive data collection and analysis and management of energy efficiency projects."

Zoran Dordević, JKP Gradska toplana Niš, City heating plant Nis, Srbija, Serbia

EUREMnext:
`Taking European Energy Managers to the next efficiency levels by implementing energy audit recommendations´

What is the overarching strategic objective of EUREMnext?

The initiative `Taking European Energy Managers to the next efficiency levels by implementing energy audit recommendations´, started on 1st March 2018. The kick-off meeting of the 40 month-long project took place in Nuremberg on 4th and 5th April 2018. The EUREMnext project is funded by the Horizon 2020 Research and Innovation Programme of the European Commission under Grant Agreement No. 785032. The total project volume is € 1,809,556.

EUREMnext is carried out by a consortium of 13 partners, headed by the Nuremberg Chamber of Commerce and Industry. The overarching strategic objective of this project is the extension of the already established EnergyManager Training concept in Germany, Greece, Austria, Czech Republic, Finland and Spain to additional six „new" countries (Albania, Bosnia and Herzegovina, Estonia, Latvia, Serbia and Turkey).

Kick-off-meeting Nuremberg 2018

EUREMnext consortium at the project meeting in Riga 2019

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"I can only say the best about EUREM trainings. It was really a good time.
The Latvian Chamber of Commerce and Industry organised trainings at highly professional level. As well, I can say that all trainers were highly qualified specialists in their field and training material was presented in simple language. As an Energy Manager, I would recommend these trainings to every person, who is Energy Manager or is going to become one."

Juris Nabokins, SIA "VALPRO", Latvia

The ambition of the EUREMnext project is to contribute to both environmental protection and competitiveness in businesses by increasing the quality of energy audits and thereby the rate of implementation of energy efficiency measures. This shall be achieved by providing trainings and by strengthening the international network for European EnergyManagers.

The EUREM training has the aim to increase the availability of qualified experts with a holistic view both on the technical/engineering and economic/financial aspects of sustainable energy measures in businesses.

The practical training should enable all new EnergyManagers to introduce energy management systems like ISO 50001 in their companies.

Just within the EUREMnext project, over 220 participants have completed the EUREM training and were certified as European EnergyManagers.

*This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.

"I would highly recommend the advanced European EnergyManager training course to energy efficiency professionals. It covers a wide range of theory and practice in the areas of industry, buildings, renewable energy sources, Green IT and ISO 50001. In my case, EUREM served as a step on my path of lifelong learning and personal development. In addition, through the annual International Conferences for European EnergyManagers, I have the opportunity to meet with other EnergyManagers from around the world and share best practices and technological advances in energy efficiency."

Dr. Evgenios Karanikolaou, EYATH S.A. Greece

EUREMnext: ACTIVITIES & OUTPUTS

E-learning modules

The EUREM training was enriched with 4 new e-learning based modules, available in 12 different languages, to reduce the face-to-face training time. These e-learning modules give an overview on topics like "Energy Audit Standards", "Mobility Management", "Employee Motivation & Communication of Energy Issues" and "Efficiency by Industry 4.0". Two further modules, which are not only e-learning based, but are designed to be mainly held face-to-face, complete the set of new course elements. "The Financial Project Appraisal" module aims to support participants in considering the main cost categories that are important when calculating the cost-effectiveness and profitability of an energy efficiency project. The "Energy Audit Support Tool" – a tool to evaluate sustainable energy measures and facilitate energy audits – completes the e-learning concept. In addition, podcasts were created to enhance the learning effect and to attract new external users.

EUREMnext podcasts

- **"Fast forward energy audit - a tool helps"**
- **"Challenges and chances of integrating e-charging infrastructure"**
- **"Ventilation and Air conditioning: Experiences from the COVID-Pandemic"**
- **"How to maximise the profitability of your photovoltaic system?"**
- **"New optimisation tool: Why it is worth diving into it"**
- **"The Project EUREMnext helps to improve energy efficiency in companies"**

"The European EnergyManager training was very efficient for me. The programme offered me a global perspective, a very effective excel application, valuable trainers and a wide range of network opportunities.

Cengiz Ören, Enerjisa Enerji, Turkey

Good to know The e-learning modules are also accessible to energy enthusiasts not subscribed to an EUREM course to extend the knowledge in energy efficiency. All e-learning modules are available for public in 12 languages at **https://training.eurem.net/course/index.php?categoryid=64**

Coaching Greece at AHK Turkey

Coaching & national anchoring

The "experienced" countries (AT, CZ, DE, ES, FI, GR) supported the six "new" countries in successfully implementing the EUREM training, by a kind of advanced coaching. All six "new" countries (AL, BA, EE, LV, RS) have successfully finished their pilot courses. A further step was to achieve national accreditation/ recognition in order to enable a continuation of the training offer after the project duration.

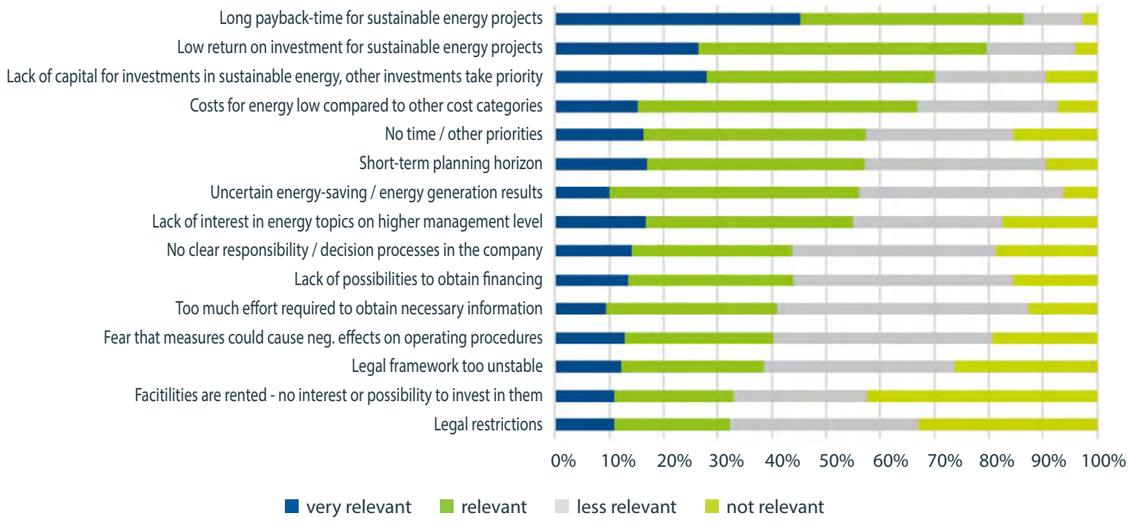
Alumni survey results

Round about 360 EUREM alumni from 20 different countries worldwide participated in a survey that was conducted to find out what additional support would help EnergyManagers to implement more sustainable energy projects. Moreover, more than 200 European EnergyManager graduates were asked about reasons for non-implementation of energy measures, to gain more insights on barriers for improving businesses' energy situation.

Based on the results of the alumni survey, additional `Implementation Support Activities´ (ISAs) were created, which support course participants, alumni and newly qualified energy auditors beyond the training scope. Within the framework of these ISAs, additional workshops on energy audits, on convincingly presenting energy measures to decision makers (`Pitching Practice Workshop´), and regular alumni meetings to exchange experience and be updated on new developments were tested in the 12 project countries. In order to further optimise the quality of the training units and to verify the likelihood of implementation of the energy projects, follow-up calls were arranged with the course participants two times after course completion.

It is encouraging that around four out of five of the energy efficiency projects developed by the European EnergyManagers during the training are implemented in practice. The most important barriers preventing the implementation of sustainable energy measures are a long pay-back time, a low return on invest and a lack of capital for investments in energy efficiency.

Factors hindering energy efficiency



(n=149 on average)

Worldwide network: real & virtual

One component of the EUREMnext project focuses on the extension of the continuously growing network of energy efficiency experts. Conferences, workshops and alumni meetings provide a personal and virtual exchange of experience. The international Conferences for European EnergyManagers offer the opportunity for direct knowledge transfer across national borders. Several hundred energy managers discuss current topics on energy saving, energy efficiency, energy management, and the use of renewable energies. They learn about exemplary energy efficiency projects in topic-related workshops. Two international conferences were held as part of the EUREMnext project.

The 9th International Conference for European EnergyManagers in Prague was organised by AHK Services s.r.o. (AHKS) in November 2018. About 170 energy enthusiasts out of 22 states enjoyed the face to face experience exchange.

Conference plenary room in Prague 2018

The 10th International EUREM Conference took place in October 2020, within the framework of a virtual event due to Corona pandemic restrictions. It was originally planned as a presence meeting event in Athens. The organisation was done by the German Hellenic Chamber of Industry and Commerce in Greece (DGIHK). More than 230 participants from 20 countries worldwide and 15 speakers from 10 different countries have participated in the conference.

Opening speeches at the online conference 2020
Professor Athanasios Kelemis (Managing Director, German Hellenic Chamber of Industry and Commerce, Thessaloniki, Greece) | Dr. Spyros Economou (President & General Director, Centre for Renewable Energy Sources and Saving (CRES), Athens) | Dr. Robert Schmidt (Head of EUREM Community and Head of Innovation & Environmental Affairs Division at the Nuremberg Chamber of Commerce and Industry, Germany) | Alexandra Tavlaridou, (Project manager EUREMnext, German Hellenic Chamber of Industry and Commerce, Thessaloniki, Greece)

Highlights of both conferences were the handing over of the international EUREM Awards and EUREMnext Awards, which were handed over for particularly outstanding energy concepts. The ceremony was guided by Stefan Schmidt (Managing Director of EUREM International GmbH, Nuremberg).
On the occasion of the two conferences, projects were awarded from Argentina, Chile, Austria, Bulgaria, Estonia, Germany, Slovakia, Slovenia and Spain, among others.

EUREM Award trophies

EUREMnext Award winner 2020, Pēteris Grundins, Latvia

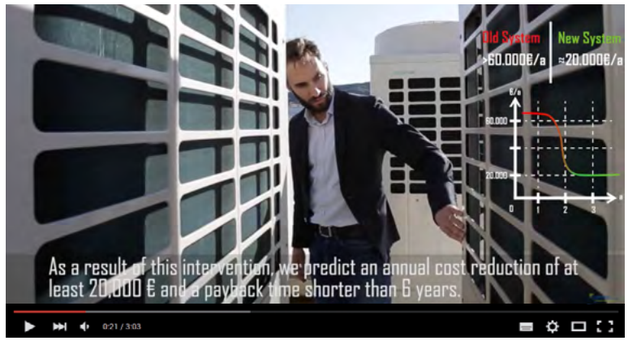
EUREM Award winners 2018

"I was very surprised by the EUREM course. In my professional career I participated in dozens of courses, so I can compare. And EUREM was really the best. Excellent organisation, very high skilled and experienced lecturers, interesting topics and plenty of new important contacts with lecturers and also with other colleagues. I would like to repeat the course or some parts of it again."

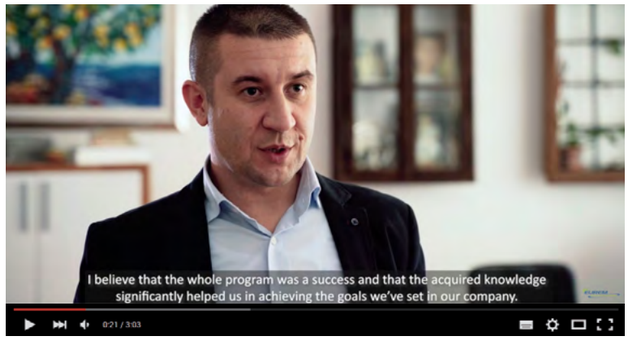
Vladimír Houser, CI Manager, Continous Improvement, Sage Automotive Interiors, Strakonice Fabrics, s.r.o., Czech Republic

EUREMnext

Communication & dissemination



Optimisation of a Data Centre Room Cooling System in Albania



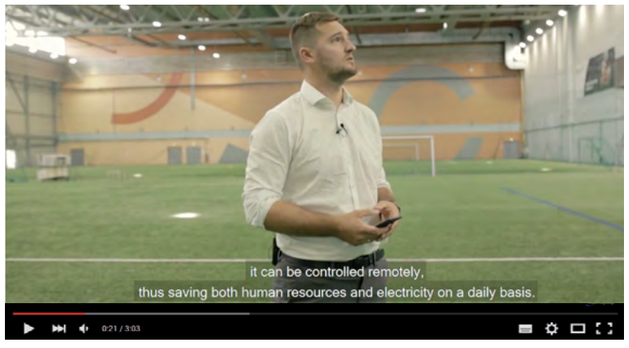
Heat recovery from the production process of metal-working machinery

Reconstruction of the lighting for an engine and generator factory warehouse in Estonia

EUREMnext video clips

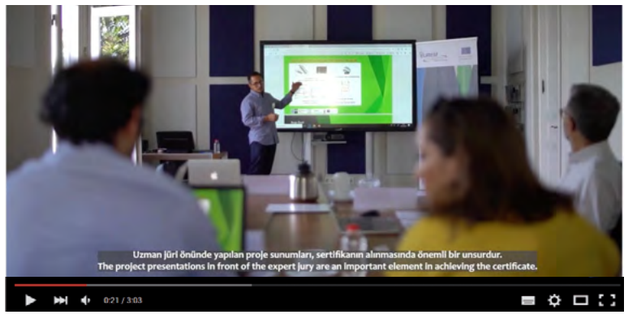
One milestone of the EUREMnext project was to produce six good practice videos – one from each of the six "new" partner countries. The videos should highlight the benefits of energy efficiency and sustainable energy measures by presenting an energy efficiency concept that the trainees developed during the EUREM training, and at the same time present the trainees' experience with the EUREM course and its benefits. The videos are intended to give outsiders an impression of the training and should arouse interest in the topic of energy efficiency and energy management.

Each video was produced in the national language with English subtitles. All videos were published on the EUREM website at **https://www.energymanager.eu/en/**



Electrical optimisation in an Olympic Sports Centre in Latvia

Heat pump replaces old cooling system in Serbia



Interview on EnergyManagers' experience with the EUREM course

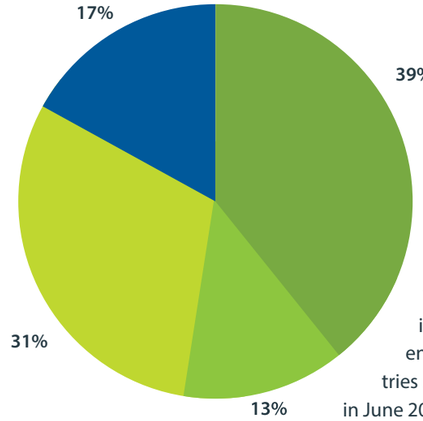
The videos are also available for the public on the EUREM YouTube channel, **https://youtube.com/channel/UCfUJ0vfLhy_Xi-k3HtrRG0g**

Check out the following videos in which some of the participating EnergyManagers give insight about EUREMnext and their energy concept.

Do you want to be part of the EUREM community and always be informed about the latest news? Follow us on Twitter: **https://twitter.com/EUREM_Energy**.

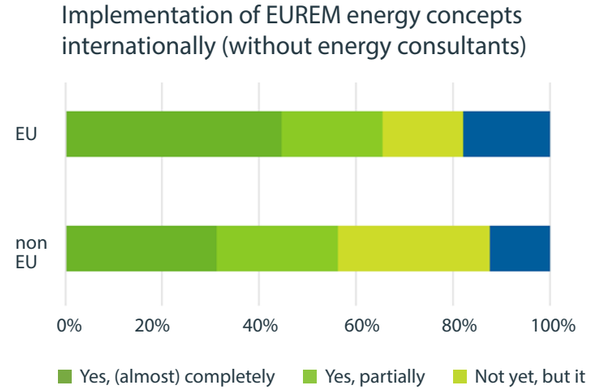
EUREMnext:
ENERGY EFFICIENCY RESULTS

Countries (number of participants P)	Total saving potential (all energy sources, renewables included) (kWh/a)	Renewable energy generated (kWh/a)	Cost saving potential (€/a)	CO_2-saving potential (t/a)	Investment costs (€)	Average pack-back time in years
Albania (23 P)	14,201,735	213,011	1,720,854	6,088	12,126,390	4.9
Average/Participant	617,467	9,261	74,820	265	527,234	
Austria (42 P)	39,982,245	2,195,724	1,338,517	10,675	3,776,499	2.4
Average/Participant	951,958	52,279	31,869	254	89,917	
Bosnia & Herzegovina (12 P)	1,909,632	183,879	671,294	3,563	3,075,425	4.6
Average/Participant	159,136	15,323	55,941	297	256,285	
Czech Republic (28 P)	25,395,260	2,590,250	1,609,336	16,449	11,374,550	6.8
Average/Participant	906,974	92,509	57,476	587	406,234	
Estonia (13 P)	7,623,823	0	343,548	5,779	534,525	2.6
Average/Participant	586,448	0	26,427	445	41,117	
Finland (12 P)	11,652,920	779,000	1,418,993	28,108	2,422,635	4.7
Average/Participant	971,077	64,917	118,249	2,342	201,886	
Germany (2)	7,908,106	921,019	704,652	3,339	4,608,387	4.4
Average/Participant	292,893	34,112	26,098	124	170,681	
Greece (11 P)	32,035,580	9,952,312	4,925,694	21,542	6,398,469	3.0
Average/Participant	2,912,325	904,756	447,790	1,958	581,679	
Latvia (15 P)	15,086,468	37,119	692,431	3,534	2,823,384	8.9
Average/Participant	1,005,765	2,475	46,162	236	188,226	
Serbia (16 P)	14,915,882	2,525,615	940,609	7,967	3,675,196	4.3
Average/Participant	932,243	157,851	58,788	498	229,700	
Spain (13 P)	7,775,445	929,328	605,380	2,401	2,855,338	4.2
Average/Participant	598,111	71,487	46,568	185	219,641	
Turkey (10 P)	36,589,287	0	2,863,354	11,962	7,174,671	1.9
Average/Participant	3,658,929	0	286,335	1,196	717,467	
Total (222 P)	215,076,383	20,327,256	17,834,663	121,407	60,845,468	
Average/Participant	968,813	91,564	80,336	547	274,079	

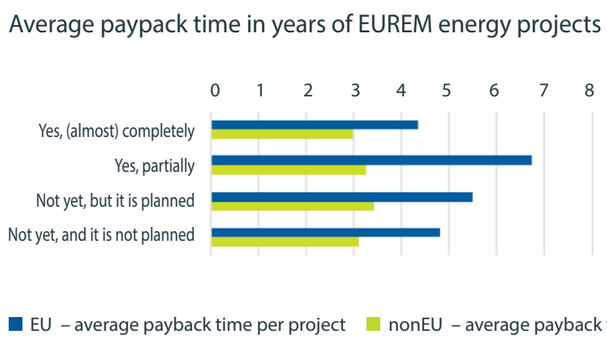


Implementation rate of EUREMnext energy concepts

The pie chart shows the implementation rate of the energy concepts of all countries until the end of the project in June 2021. Based on the results of the follow-up interviews, four out of five energy concepts are already implemented or are planned to be implemented in future. More than a half of the energy concepts have been fully or partially implemented. More than 30% of the respondents plan to implement their energy concepts in the near future. There is only a share of 17% that will most likely not to be implemented. The preliminary figures of the exceptionally high implementation rates once again prove the success of the EUREM training concept and network, which has been tried and tested in practice for many years.



The responses to this question confirm that the EUREM courses worldwide support participants in preparing an implementation-ready concept for an energy measure. About 82% of respondents in EU countries and 88% in non-EU countries said their projects were implemented (at least partially) or are planned to be implemented. This calculation does not include energy consultants / energy auditors. Including this sector, the figures would be the following: 81% in EU countries, 85% in non-EU countries.

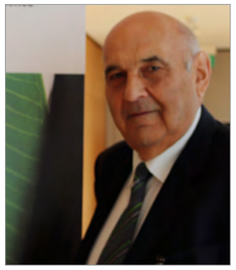


In EU countries the average payback time for completely, partially implemented projects or for projects with planned implementation is approximately 5 years, for projects where implementation is not planned it is 4.8 years. In non-EU countries the average payback time for both implemented and not implemented projects is about 3.2 years.

EUREMnext: PROJECT PARTNER DESCRIPTION

Albania

Austrian Institute of Excellence Shpk



Dr. Hans Spernbauer |
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Officially founded on 28.12.2000, the Austrian Institute of Excellence (AIEx) began its journey by slowly entering a market yet to be tapped and steadily confirmed its place by officially becoming a WIFI International branch in 2013. AIEx has more than 20 years experience in delivering training programmes and persons' certifications in soft skills and technology in accordance with the requirements of EN ISO/IEC 17024 through the WIFI Certification Body and at the local level, according to the national standard.

During 2018 – 2021 AIEx introduced the EUREM standard to the Albanian market by implementing EUREMnext. During the course, more than 180 learning hours took place and 23 European EnergyManagers successfully received their EUREM certificates, handed over to them by representatives of the European Union in Albania, the Austrian Embassy and several representatives of international companies operating in Albania.

2021 finds AIE with a completed team of experts, counting more than 30 senior experts, who bring their local and international expertise to the Albanian and Kosovar market.

Our team is experienced in conceptualising, planning and executing multi-phase programmes. We work out each phase of the programme in detail, adapting briskly to changing situations and following up with analysis of results and data.

Our in-house Data Management System and Learning Management System allow us to work with modern and sophisticated tools and solutions to assist and support every project we undertake. AIEx was the first in town providing a 360° Learning & Development Consultancy to operate & rent a complete solution for your L&D: a very user-friendly Learning Management System & the development of modern e-Learning modules, as per client's need!

Workshop EuroElektra

Austria

Austrian Federal Economic Chamber (WKO)
Energy Institute for Business

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Austrian Federal Economic
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The Austrian Federal Economic Chamber (Wirtschaftskammer Österreich) coordinates and represents the interests of the Austrian business community on a national and international level. Within the system of the Austrian Economic Chambers, it functions as the umbrella organisation for the trade associations for different industries and the nine regional Chambers, who have local offices to provide services and expert advice in close proximity to members. Membership includes more than 540,000 businesses.

WKÖ has been offering the EUREM training since 2004, and by 2021, more than 500 EnergyManagers have successfully completed the course in Vienna.

Its subsidiary, the Energy Institute for Business (Energieinstitut der Wirtschaft) is a non-profit organisation that promotes energy efficiency and the transformation towards a sustainable future energy system, among others by means of information and training activities and publications about sustainable energy in businesses.

Graduation ceremony & alumni network meeting 2019, Vienna

Austria

AEE - Institute for Sustainable Technologies

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AEE - Institute for Sustainable Technologies (AEE INTEC) was founded in 1988 and is today one of the leading European institutes for applied research in the field of renewable energy and resource efficiency. In the three target group areas "Buildings", "Cities & Networks" and "Industrial Systems" as well as three technological working groups "Renewable Energies", "Thermal Storages" and "Water and Process Technologies", the range of R&D projects carried out extends from basic research projects to the implementation of demonstration plants.

The department "Industrial Systems" is addressing the development and realisation of innovative and visionary implementation concepts for nationally and internationally operating production companies and research partners. The core of the solutions offered is the increase in energy and resource efficiency and the share of renewable energy sources in hybrid process and supply systems. With the help of digitalisation as a method and tool, concepts are developed which design, operate and link the in-house supply with other sectors under technical, ecological and economic aspects.

Decarbonisation is of highest priority for industry, consuming about one third of Europe's energy needs. Additionally, advancing digitalisation will lead to a significant increase in productivity and thus in energy demand over the next few years.

To support companies in the optimised energy system design and operation is essential to achieve climate goals and set visions. Within EUREMnext AEE INTEC has further developed the Energy Audit Support Tool, to address the identified challenges. A quick and easy identification of optimisation measures (energy efficiency and renewable energy) and their impact from the energetic, economic and ecologic perspective shall be the door-opener to 100% renewable industry.

Bosnia & Herzegovina

Delegation of German Industry and Commerce in Bosnia and Herzegovina

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The network of German Chambers of Commerce Abroad (AHKs), consists of 140 bilateral Chambers, delegations and representative offices of German business in 92 countries. The Delegation of German Industry and Commerce in Bosnia and Herzegovina is the official representative of German business, member organisations and, as an experienced and competent partner, supports German and Bosnian-Herzegovinian companies in market development, expansion and business initiation. AHKs support the market interests of German companies in the host country. At the same time they provide services to local companies which are involved in bilateral business. They are increasingly active in the marketing of Germany as a business location for interested companies in the host country. Under the service brand `DEinternational´ the AHKs provide services which are globally harmonised and special services according to special requirements of the very location.

Furthermore, DEinternational BiH is a service provider for: companies (trainings, market information, address and business partner search), is organising seminars and workshops, conferences and events and executing projects. DEinternational BiH has gathered experience in the field of energy and thus knowledge of the structures of the energy market in the region over the last years through various activities.

- Implementation of projects within the framework of `export initiative energy´ (by the German Ministry for Economic Affairs and Energy)
- Implementation of projects within the framework of `Bayern-fit for Partnership´ (by the Bavarian Ministry for Economy)
- Participation in different events and conferences with energy focus (energy summits, workshops, etc.) in Germany and Bosnia-Herzegovina
- Advising German companies entering the regional market in the field of energy together with local experts
- Creating multiple market studies, e.g. for biomass, wood, energy efficiency.

Czech Republic

AHK Services s.r.o.

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The German-Czech Chamber of Industry and Commerce (GCCIC) in Prague was founded in 1993 as a successor of the German Business Delegation in the Czech Republic. Today, about 700 companies – including the most important investors in the Czech Republic – are members of the Chamber. GCCIC is part of the network of German Chambers abroad. This network is coordinated by the German Federation of Industry and Commerce (DIHK) in Berlin. The network of German Chambers, delegation offices and representations, which offer their services in more than 92 countries with 140 offices on every continent of the world, is of major importance to German companies in today's world of integration of global markets.

The main task of the chamber is to improve and intensify the relations and contacts between businesspeople of both countries. Different corporate publications, e.g. the bilingual magazine `PLUS' are supporting this intention. For a more efficient organisation of the consulting services area of the Chamber, GCCIC founded in 2010 a daughter company, called AHK Services s.r.o..

AHK Services offers a wide range of services, including research of potential business partners, market studies, support for setting up business and basic information about the legal and economic framework in both countries. Special competence centers were created, in order to offer sector oriented know-how in the following fields: Energy & Environmental Technologies, Automotive & Engineering, Innovative Technologies, Food Sector.

Since 2008, GCCIC/AHK Services has been offering the training course for European EnergyManagers (EUREM). AHK Services s.r.o. also organises and offers technical conferences, seminars, fact finding missions to companies in Germany and the Czech Republic, as well as workshops. The EUREM training programme achieved national accreditation by the Czech Ministry of Education.

Handing over of the EUREM certificates in Prague

Estonia

Estonian Chamber of Commerce and Industry

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Marju Männik |
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The Estonian Chamber of Commerce and Industry (ECCI) was established in 1925 and re-established in 1989. The ECCI is the oldest and biggest representation organisation for companies in Estonia. It is a private, non-profit organisation covering whole Estonian region, having regional offices located in: Tartu, Pärnu, Jõhvi and Kuressaare and headquarter located in Tallinn. Currently, the ECCI represents about 3,500 enterprises that are responsible for more than 40% of the total net turnover of Estonian companies, nearly 40% of net profit and pay more than 40% of state taxes. These enterprises are predominantly in the textile, metal, timber, construction and food industries. 98% of ECCI member companies are SMEs.

The mission of the Chamber is to develop entrepreneurship in Estonia through taking actively part in designing economic policy and via rendering business services. The ECCI is an active partner to the parliament, government and ministries in designing the economic policy and climate by speaking actively on behalf of the Estonian business community.

ECCI also provides many practical business-related services like consultations, business matchmaking, information services, trainings and foreign trade documents. ECCI hosts the Arbitration Court, which is the only permanent arbitration court in Estonia. Since 2008 ECCI is a partner and coordinator for the Enterprise Europe Network in Estonia, which helps to support businesses in building their innovation capacity, supporting their potential to grow and providing internationalisation support.

Various projects, which are implemented by ECCI, focus the topic energy efficiency. From 2014 to 2017, ECCI carried out the European project „STEEEP" – Support and Training for an Excellent Energy Efficiency Performance – (funded by the European Union), which helped 600 European cross-sector SMEs to reduce their energy consumption and become more energy-efficient.

From 2018 to 2021, ECCI has been part of the project team of EUREMnext. One of the main outcomes of the project has been adapting and implementing the EUREM European EnergyManager course in Estonia, which took place throughout the year 2019, with 13 company graduates, who in addition to EUREM European EnergyManagers diploma, also received national certification points.

Alumni meeting in Estonia 2020

Finland

AEL-Amiedu Oy (Taitotalo)

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Taitotalo is Finland's leading vocational adult education centre, serving the educational and training needs of round about 18,000 adults every year.

Taitotalo was formed when Amiedu (founded in 1976) and AEL (founded in 1922) merged in the year 2020. Taitotalo has almost 400 employees and offers trainings from various areas, including the energy sector.
In the energy sector, Taitotalo trains power plant operators, district heating workers and energy efficiency experts by offering the EUREM EnergyManager training programme.

Taitotalo has delivered ten EUREM courses in the last ten years and course number eleven will start in autumn 2021. So far, 78 students have successfully completed the EnergyManager training. Over 13 million Euros in savings have been achieved in the graduates' energy projects by now. The training courses take place at the Taitotalo training facility in modern classrooms with all the necessary equipment for the training courses.

Alumni meeting at Valio dairy plant at Jyväskylä

Germany

Nuremberg Chamber of Commerce and Industry

Dr.-Engineer Robert Schmidt
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The Nuremberg Chamber of Commerce and Industry (NCCI) represents 150,000 enterprises in the Nuremberg region, offering information, consulting, training and advisory services. It has been very active in the thematic area of energy for years and is experienced in EU projects (e.g. LIFE, ADAPT, INTERPRISE, SAVE, CENTRAL EUROPE, HORIZON 2020). Through the setting up of diverse user clubs and working groups for the individual thematic areas, a highly competent knowledge and enterprise-based energy network has been built up.

NCCI offers single and group consulting services for the members of the Chamber of Commerce and Industry in energy-related matters as well as guidelines, handbooks publications and manuals for energy users. Rapid and state-wide dissemination of the project outcomes through the Association of German Chambers of Commerce and Industry (DIHK) is guaranteed as CCI Nuremberg is a member of the umbrella organisation DIHK and closely with it.

The CCI Nuremberg offers up-to-date specialist knowledge in forums, which are complemented by occupational training courses. One example is the nationwide certification course "EnergyManager (CCI) / European EnergyManager (EUREM)".

EUREM was initiated by the CCI Nuremberg and further developed through several international projects. Since 1999, NCCI has been offering the training course for European EnergyManagers and by the end of 2021 344 EnergyManagers have participated in the course.

Site visit alumni meeting 2019

Greece

German Hellenic Chamber of Industry and Commerce

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The German Hellenic Chamber of Industry and Commerce (DGHIK) acts as a two way "gateway" between Greece and Germany, for more than 95 years. It was founded in 1924 in Athens and the Department of Northern Greece was established in late 80s. It consists of 890 members, and is part of the Worldwide Network of German Chambers of Commerce abroad, with 140 offices in 92 countries. At the moment, DGIHK is holding a team of 31 employees in total.

DGIHK provides a broad spectrum of services to its members and entrepreneurs. Main focus is given in certain sectors, projected by the characteristics/needs of Greece, such as Energy, Environment, Training & VET, Tourism, Agrofood, IT applications and Start-ups. Focusing also at members networking, partner search and establishment of partnerships, the Chamber organises conferences, B2B meetings, sectoral events, workshops and provides legal and tax services. The energy working group presents the most intensive activity, consisting of member companies and representatives of related key players association of the energy sector. DGIHK has cultivated solid relations with national chambers, associations, local authorities and the Greek ministries.

Experience in project implementation arises from management of EU, DE, GR and on demand projects (programmes such as: HORIZON 2020, EU Intelligent Energy Executive Agency, ASIA Invest, Black Sea CBC Programme, Interreg GR-FYROM IPA CBC Programme, PHARE, GR - General Secretariat of Research and Technology, DE - German Federal Projects).

The German Hellenic Chamber is part of the EUREM Community since 2006 at the 2nd EU funding period of EUREM Project. EUREM is one of the main products of DGIHK in its training portfolio. The German Hellenic Chamber has so far conducted 11 courses of EUREM trainings in Greece. Up to 2016, 7 courses were implemented in Athens and another 2 in Thessaloniki in training centres cooperating with DGHIK and with a total set of 25 trainers for both locations.

Latvia

The Latvian Chamber of Commerce and Industry

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Latvian Chamber of Commerce and Industry (LCCI) is the biggest association of entrepreneurs in Latvia uniting 6000 members – micro, small, medium and large enterprises of all regions and industries, associations, city business clubs and other unions of entrepreneurs. The association represents interests of entrepreneurs, as well as provides services, so that Latvia has excellent enterprises in an excellent business environment. The main sectors of its activities are business environment, competitiveness of enterprises and export.

LCCI was founded on 2st December 1934 and is a member of the Association of European Chambers of Commerce and Industry (EUROCHAMBRES) and the International Chamber of Commerce (ICC). LCCI is actively participating in implementing projects, funded in different EU programmes (INTERREG, Erasmus+, Horizon2020 etc). The main topics are: SMEs trainings; export; entrepreneurial policy; VET topics; cluster support and development, and further topics related to business. As well, LCCI has competence in the energy efficiency field. LCCI has its energy sector committee that is actively working on different questions that are related to energy policy in Latvia.

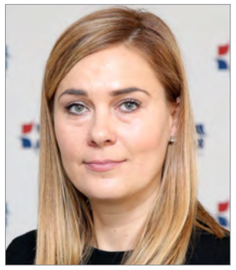
EUREM trainings were offered for the first time in 2019 and were organised and held in Riga, at the LCCI premises. At that time, more than 60 people applied for the trainings, but only 15 people were selected. All 15 participants from 14 companies successfully completed the EUREM training programme. After completing the course, the graduates presented their energy projects in front of an expert jury, becoming the first alumni from Latvia to ever complete the EUREM training.

During the final presentation of the project works, the national winner was also selected, with a chance to participate in the 10th International EUREM Conference, organised by the German Hellenic Chamber of Industry and Commerce in Greece (DGIHK). Pēteris Grundins, a Latvian graduate, was awarded with the EUREMnext Award.

Handling over of the EUREMnext certificates

Serbia

Chamber of Commerce and Industry of Serbia



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The Chamber of Commerce and Industry of Serbia is an independent, non-governmental, business interest association and a reliable partner of Serbian companies on their business path, as well as a promoter of Serbian companies abroad, by representing more than 122,000 members. The strategic goals of the Serbian Chamber of Commerce are to actively strengthen the country's economic development, boost exports and foreign direct investments, increase the competitiveness of the Serbian economy and labour force, and further develop of entrepreneurship and promote the Serbian economy.

The main activities of the CCIS are representing the interests of economy in front of the government and other state bodies e.g. by strenghtening internationalisation – through improvement of international economic cooperation and promotion of Serbia as a good investment destination. CCIS provides consulting in doing business in the EU and offers services in cooperation with ministries of the Government of Serbia and other institutions involved in the creation of national economic policy. CCIS is working on creating a stimulating business climate in Serbia, towards a healthier and more competitive business environment in line with European standards. Furthermore CCIS offers business trainings to improve the skills of employees and thus strengthening the competitiveness of the domestic economy in the EU association process.

Another topic area is energy efficiency. The Energy and Mining Association is a CCIS industry association that unites companies registered to carry out energy activities under the Energy Act. The association monitors renewable energy sources and energy efficiency in particular and has set up the Green Energy Information Portal.

CCIS offered the EUREMnext training programme for the first time in 2019 by organising one free of charge training for representatives of 17 local companies. All participants passed their written test in June 2019 and 16 of them finished their energy concepts successfully.

EUREM graduates of Serbia

Spain

Escan s.l.

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Escan s.l. is a Spanish consulting firm, founded in 1986 that offers technical, economic and financial advice on energy planning, energy efficiency, sustainable energy and smart grids.

Our main clients are public institutions, private companies, associations and other organisations, focused on achieving their energy-, environmental- and socio-economic targets. The consultants develop projects mainly in Europe and Latin America with active participation in THERMIE, SAVE, SYNERGY, Fifth RTD Framework Programme, EURELA, HORIZON 2020, MEDA, Inter Reg EUROPE, etc.

Moreover Escan s.l. organises training for technical professionals like EUREM, EUREMnext, EPC-energy performance contracting, DIGI-LABEL; energy audits for industry sector, vapour systems; Life Cycle Asssement and Product Life Cycle.

Since 2008, Escan has been offering the training course for European EnergyManagers (EUREM) and by mid-2021 more than 170 EnergyManagers will have successfully completed the course. EUREMnext in Spain has been successfully completed with 13 graduates.

Course participants of the Spanish EUREM training

Turkey

DEinternational Servis Hizmetleri A.S (AHK Turkey & DEAS)

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DEinternational Servis Hizmetleri A.S (DEAS) is the service company of the German-Turkish Chamber of Industry and Commerce (AHK Turkey). AHK Turkey is based in Istanbul, Izmir and Ankara and has approximately 880 members nationwide. AHK Turkey & DEAS offer a variety of services, events, tailor-made company consultancy, sectoral business trade missions, trainings, and advanced education seminars for all stakeholders in the private sector. They also posses a wide-ranging public recognition, as well as a broad network of international partners.

In 2013 the German-Turkish Energy Dialogue has been formally established to support the cooperation between Germany and Turkey within the energy sector. DEAS acts as the coordinator body for Germany and contributes to the knowledge transfer within the five working groups (renewable energy, energy efficiency, energy infrastructure and sector coupling, flexibilisation of conventional power-plants and regulation of electric- and gas market). Moreover, DEAS facilitates direct exchange between public and private representatives of Germany and Turkey and provides a wide-ranging experience and expert pool. Until now, DEAS has conducted over 20 energy market delegation trips to Germany and Turkey. Further, AHK-Turkey's own energy working group consists of all known major German energy companies with investments in Turkey.

With the support of the Energy Efficiency and Management Association (EYODER), the EUREMnext project has been successfully implemented in Turkey. The training commenced in December 2019 within the premises of AHK Turkey. 10 graduates have successfully completed the training programme. With this first training DEAS and AHK Turkey gained the attention of the Turkish Ministry of Energy and Natural Resources, which lead to higher recognition in the private sector. Due to this success, we plan the continuance of the EUREM EnergyManager training programme in the future.

Course participants of the first training

ENERGY EFFICIENCY CONCEPTS

Installation of a 503 kWp PV plant in three different areas of the factory

Topic: Solar energy

Energy Manager
Alfred Zeneli
Company: Antea Cement Sh.A., part of Titan Group

ENERGY CONCEPT DESCRIPTION:

ANTEA CEMENT Sh.A. cement plant is focusing the construction of the photovoltaic power stations (solar parks) presenting its technical and economic aspects, in comparing the data model between two different photovoltaic panels. The proposed solar park is spread over three different areas with a total of effective surface seffective of 2,568 m^2 and will be installed inside the cement plant. The generated electrical energy will be used for personal consumption and will be synchronized to the cement plant 6.3 kV power grid.

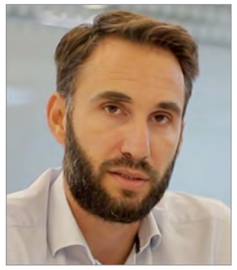
For the presented photovoltaic power station, which is proposed to be installed in "Antea Cement Sh.A." cement plant, the modelling and analysis costs of a 503 kWpeak photovoltaic generator network with an annual output of 676.3 MWh and initial investment costs of 387,680 Euro were determined. The selected areas for installing the photovoltaic power station are close to the electricity distribution system, which makes the integration into the existing power network much easier. These areas consist of 2 building terrace surfaces and another on flat ground near the electrical substation.

Results

Investment in Euro: **387,680**
Cost reduction in Euro/Year: **46,000**
Pay-back-time in years: **10.8**
Energy saving potential in kWh/a: **676,300**
CO_2 saving potential in t/a: **415.9**

RBAL Data Centre Room Cooling System Optimisation

Topic: Cooling | Green IT



Energy Manager
Ergi Kadiu
Company: Raiffeisen Bank

ENERGY CONCEPT DESCRIPTION:

The project aims to reduce and optimise the energy consumption for a central data centre cooling system. The existing situation of the cooling system had few issues as airflow direction, capacity of cooling and room organisation. The existing system is composed of 4 AC units 48,000 BTU, 3 AC units 42,000 BTU, 2 AC units 60,000 BTU. The total existing thermal cooling capacity for this room is 125 kW. The airflow and internal units are installed in the wrong way because the air distribution becomes incorrect and this effects energy bills and high amortization of AC equipment. The air distribution in this room is from top to bottom and this directly affects the cooling quality of the IT-equipment. The existing room surface and organisation need both optimisation and reorganisation of the existing equipment. The old IT-technology has a huge impact on cooling and energy consumption of the room.

Optimisation potentials / Weak points:
- Reorganising the existing room (optimise the cooling area)
- New inverter technology to be implemented
- Airflow to be reorganised from the technical floor
- The existing equipment will be used in other areas in the bank

Optimisation possibilities:
The existing room will be optimised with a gypsum and glass thermal wall to reduce the cooling capacity; new AC professional system will be implemented including a backup solution. The new air circulation will be from the bottom (raised floor) with some grills circulation that will be opened for cooling connection with the room.

Effects:
New Investment will have a direct impact on electricity bills and general maintenance of AC equipment and IT equipment inside the room. Return of investment will be approximately 2.7 years and the new equipment total depreciation is 7 years.

Results

Investment in Euro: **63,500**
Cost reduction in Euro/Year: **21,000**
Pay-back-time in years: **2.7**
Energy saving potential in kWh/a: **247,404**
Date of implementation: **November 2019**

EUREMnext AWARD winner 2020

Do you want to learn more about Ergi Kadius energy concept? Here is the video link:
https://www.youtube.com/watch?v=O0X1QgbLqS4

Base Load Management

Topic: Energy data management systems

Energy Manager
Philipp Hartl
Company: CNH Industrial Österreich GmbH, St. Valentin

ENERGY CONCEPT DESCRIPTION:

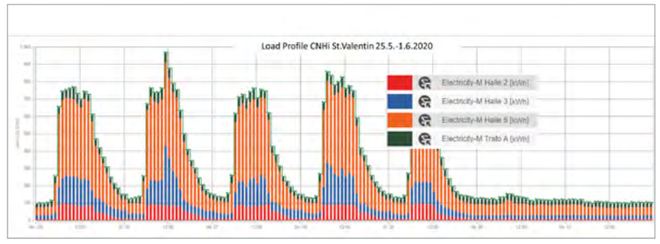
Aims:
The aim is to analyse the load profile and determine options for reducing the electrical base load at the St. Valentin location.

Base situation:
A target level for the base load was defined. Deviations were searched for in the 30 available meter values.

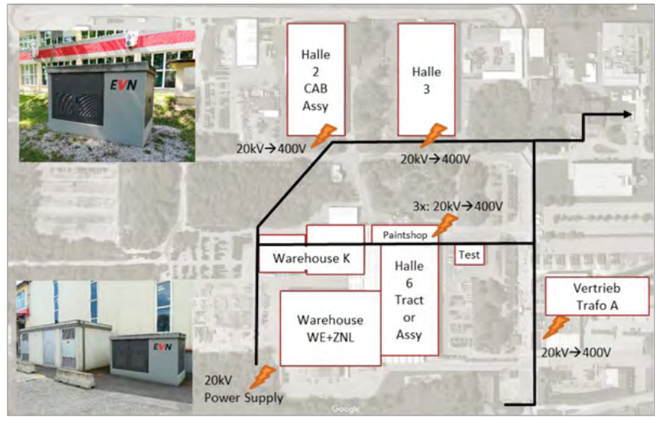
Optimisation potentials / Weak points:
1.) A compressor was not switched off during the production-free period.
2.) Hall lightings with 25 kW and 50 kW power remained switched on unnecessarily.
3.) Also, a hall lighting with 10.4 kW power.

Proposals of solution / Optimisation possibilities:
ad 1.) A lock signal from the building management system switches the compressor off when it is not needed.
ad 2.) An organisational regulation ensures the shutdown.
ad 3.) A change in the control cabinet provides a switch-off option.

Effects:
With the measures we save 124 MWh annually. This is 5.1% of the electricity consumption in the production area. The saving is € 10,534 with investments of € 1,961. The project will pay off in 0.2 years. Additionally, 196.3 MWh of saving potential has been recognized. These are focused in further projects.



Load Profile



Results

Investment in Euro: **1,961**
Cost reduction in Euro/Year: **10,534**
Pay-back-time in years: **0.2**
Energy saving potential in kWh/a: **123,929**
CO_2 saving potential in t/a: **32**
Date of implementation: **August 2020**

Change parts of the light system to LED

Topic: Lighting

Energy Manager
Gottfried Brandstetter
Company: confidential

ENERGY CONCEPT DESCRIPTION:

Aims:
Change the light system to LED, optimise the energy input, reduce the very high maintenance costs.

Base situation:
Conventional light tube systems, very high maintenance costs due to the spatial situation.

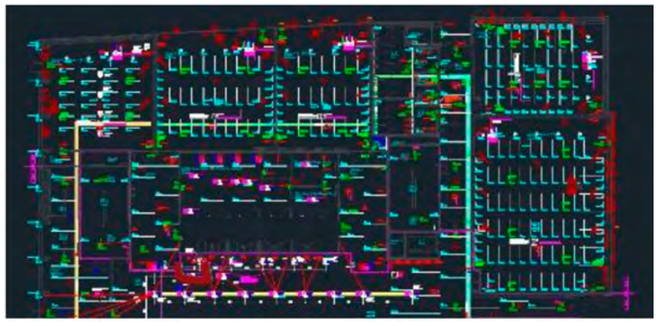
Optimisation potentials / Weak points:
Reduction of energy and maintenance costs.

Proposals of solution / Optimisation possibilities:
Change to highly efficient LED, install daylight control system and presence detector using the existing KNX-System, reduce the maintenance costs through the lifespan of the LED-System.

Effects:
Reduction of the energy consumption by 28,491 kWh/a, costs 3,077 €/a, reduction of the maintenance costs by 6,504 €/a. This results in a payback period of approx 3.1 years and the greenhouse gas emissions can be reduced by 7.3 tons per year.

Results

Investment in Euro: **29,515**
Cost reduction in Euro/Year: **9,581**
Pay-back-time in years: **3.1**
Energy saving potential in kWh/a: **28,491**
CO_2 saving potential in t/a: **7.3**
Date of implementation: **February 2021**



Photovoltaic power plant for self-consumption

Topic: Solar energy | Energy data management | Load management | Energy management systems

Energy Manager
Elma Redžić
Company: Elektroprivreda BiH d.d. Sarajevo, Tešanj

ENERGY CONCEPT DESCRIPTION:

Aims:
Reduction of costs for electricity, redu-cing the risk of electricity price changes, load management and control of the demand peak-power costs, on-site electricity generation, decrease of transmission losses.

Base situation:
The average electricity price is relatively high: 106,5 €/MWh, high monthly costs for peak-demand power.

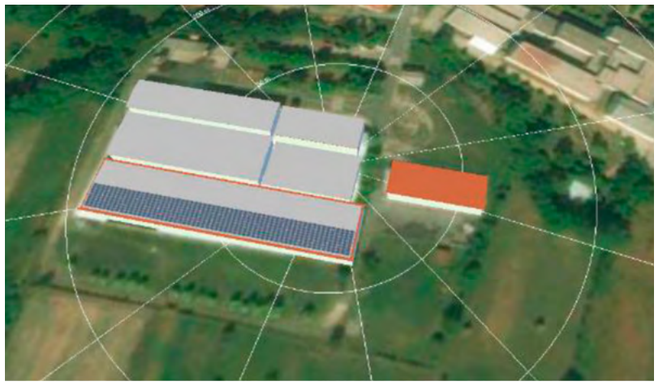
Optimisation potentials / Weak points:
The peak power demand is reduced and optimized in accordance with the demand curve. If there was law on prosumers, the installed photovoltaic (PV) power plant could be higher in order to cover higher share of own consumption.

Proposals of solution / Optimisation possibilities:
Installation of PV power plant with optimised peak power in order to reduce electricity fed into the grid (there is no law on prosumer/net metering). PV plant reduces load, and there is huge potential for additional savings by load shifting and demand-side load management.

Effects:
30% of the own consumption met by PV production, 20% of the electricity produced by PV plant is exported to the grid free of charge, peak demand significantly decreased and enables more savings by load management.

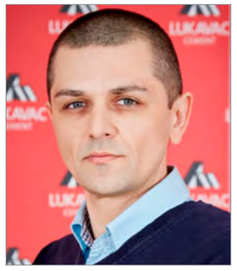
Results

Investment in Euro: **101,500**
Cost reduction in Euro/Year: **13,510**
Pay-back-time in years: **8**
Energy saving potential in kWh/a (renewable energy): **183,879**
Within the energy concept renewable energies new/additionally installed in MWp: **0.125**
CO_2- saving potential in t/a: **116.4**



Improving the energy efficiency of the clinker production line by drying alternative fuel

Topic: Process heat



Energy Manager
Emir Ćilimković
Company: Fabrika cementa Lukavac d.d

ENERGY CONCEPT DESCRIPTION:

The goal of the energy concept is to reduce the specific energy consumption for clinker production from 3.25 GJ/t clinker and to increase the share of energy from solid alternative fuels from 41 to 57% by substituting fossil fuels with alternative fuels of lower quality (higher moisture content and lower energy value of fuel) and lower market prices compared to the current state by using drying technologies for RDF (refuse derived fuel-derived waste).

The dried RDF would be used as an energy source on the calciner side, where 60% of the total amount of energy is utilised to produce the clinker.

The new technologies would use a part of the hot excess air from the clinker cooler to dry RDF as an alternative fuel, thereby reducing the moisture content of the material and increasing the energy value of this type of fuel, thereby allowing a significant improvement in the energy efficiency of the clinker production plant. Better energy efficiency of the plant has been proven earlier through industrial testing with better quality of RDF.

The RDF drying process is a closed process where the gases after drying are reused in the clinker production process and there is no negative environmental impact.

This project task would also directly reduce CO_2 emissions due to a reduction in specific energy consumption. Also, there is an indirect impact on reducing the environmental impact in a way that reduces energy consumption in waste treatment plants for RDF production, but this is not the subject of this project task.

Results

Investment in Euro: **2,500,000**
Cost reduction potential in €/Year: **525,431**
Pay-back time in years: **3.4**
Energy saving potential in MWh/a: **15,969**
CO_2- saving potential in t/a: **10,363**

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Reconstruction of steam and condensate system at the Kralupy Refinery

Topic: Process heat

Energy Manager
Agnieszka Dvořáková
Company: Rafinérie Kralupy, UNIPETROL RPA, s.r.o., Kralupy nad Vltavou

ENERGY CONCEPT DESCRIPTION:

The project includes modification and replacement of the pipeline routes, replacement of valves, steam distributors, condensate collectors and installation of a new steam-condensate pump at the refinery in Kralupy.

The aim of this project is the improvement of steam and condensate management. Start of realisation was in July 2020. The modification of the present condensate system will allow to recover 7 t/h of condensate, which will be used as feed for the boiler water system. The high temperature of the condensate will reduce the cost of heating of boiler feed water. Moreover, modification and reconstruction of the steam and condensate system will reduce steam leaks up to 400 kg/h.

Results

Investment in Euro: **1,300,000**
Cost reduction potential in €/Year: **390,537**
Pay-back time in years: **3.3**
Energy saving potential in kWh/a: **7,267**
CO_2- saving potential in t/a: **1,465**
Date of implementation: **July 2020**

Use of waste heat for preheating process water

Topic: Heat recovery

Energy Manager
Jan Lukac
Company: Miele technika s.r.o.

Energy concept description:

This thesis deals with design, realisation and testing of new technology during a test run. The technology is used for utilisation of waste heat and for water preheating. The thesis was created in consequence of the constant pressure to reduce the amount of the energy inputs for the needs of the dishwasher production plant Miele technika Uničov and the overall modernisation of the dishwasher production line.

Thanks to the complete rebuilding of the whole line, there has arisen a potential for economically advantageous element, which will reduce the company costs for electricity and natural gas by 90 MWh per year. The project was interesting from the beginning, also thanks to the expanding production with increase of the waste heat and the increasing options to use the heat further. The thesis includes also practical measurements and photos of the real state.

Results

Investment in Euro: **11,540**
Cost reduction potential in €/Year: **5,115**
Pay-back time in years: **2.2**
Energy saving potential in kWh/a: **87,300**
CO_2- saving potential in t/a: **3**
Date of implementation: **2019**

AC unit modernization for production hall H1 for electronic production

Topic: Air conditioning

Energy Manager
Martin Soukup
Company: Continental Automotive Czech Republic s.r.o.

Energy concept description:

Production hall H1 for electronic production had large problems to maintain the microclimate, because the air conditioning (AC) unit was very old. There was no possibility of humidification.

This project solves the replacement of current AC unit by new machines with required performance, economical engines and the possibility of damping directly to the pipeline of the unit.

Savings:
Continental A.G. in Brandýs nad Labem is one of the biggest automotive plants for producing electronic parts in the Czech Republic. The production is located in two buildings with more than 20,000 m² of production space, opened in 1998. Products from Brandýs are distributed to the European, Asian and American market used by more than 30 customers - mostly by car manufacturers. Yearly volume is more than 10 million pieces.

Increasing customer demands for vehicle comfort requires a higher proportion of electrical, electronic and software solutions. These are transferred to a supplier like Continental and therefore enormously increase requirements for quality, accuracy and speed of delivery. One of the conditions of success and competitiveness is to ensure the appropriate environment - microclimate according to standards for electronic production (microclimate cleanness according to ISO 8). This is why, there is a huge potential for cost-effective solutions in this area. The project will contribute to improving the environment by reducing CO_2 emissions by energy saving.

Results

Investment in Euro: **212,600**
Cost reduction potential in €/Year: **28,000**
Pay-back time in years: **7.7**
Energy saving potential in kWh/a: **454,318**
CO_2- saving potential in t/a: **531.6**
Date of implementation: **October 2019**

More efficient use of residual energy in aerated concrete plant

Topic: Process heat

Energy Manager
Vallo Sokk
Company: Bauroc AS

ENERGY CONCEPT DESCRIPTION:

Aims:
Primary energy (natural gas) savings of residual energy.

Base situation:
Deaerator water heated with a pipe-tube heat exchanger up to 34 °C, with residual energy.

Optimisation potentials / Weak points:
The pumps pump hot condensate (residual energy) through the heat exchanger. There is no water step in front of the pumps, and the pumps generate under pressure and cavitation. Pumps need often repairs, high maintenance cost, low energy transfer efficiency.

Proposals of solution / Optimisation possibilities:
Production of the custom-made tube heat exchanger and the installation in the condensate tank. Allows deaerator water to be preheated up to 65 °C. The pumps pump cold water and do not need maintenance so often – lower repair costs.

Effects:
Economic benefits up to € 47,938 per year. An investment of € 94,600 and a payback period of 2.2 years.

Results

Investment in Euro: **94,600**
Cost reduction potential in €/Year: **47,938**
Pay-back time in years: **2.2**
Energy saving potential in kWh/a: **1,723,480**
CO_2- saving potential in t/a: **1,306**
Date of implementation: **in progress, 2021-2022**

Lighting energy efficiency project for metal Industry

Topic: Lighting

Energy Manager
Marti Arak
Company: DeltaE Engineering Office

ENERGY CONCEPT DESCRIPTION:

Aim:
Achieve maximum energy savings by designing and refurbishing the lighting installation. High quality proper lighting solution that meets the standards.

Base situation:
Energy data, on-site mapping, electricity consumption measurements.

Optimisation potentials / Weak points:
The saving potential is about 80-85% and the improvement of the level of illumination is about 50%.

Proposals of solution / Optimisation possibilities:
Design and renovate a new lighting installation with LED lighting.

Effects:
Actual results: 83% electricity savings, pay-back time 3.92 years, 2-fold improvement in illumination level, reduced glare, improved uniformity of the light, improved working conditions for workers.

Results

Investment in Euro: **58,392**
Cost reduction potential in €/Year: **14,904**
Pay-back time in years: **3.9**
Energy saving potential in kWh/a: **137,188**
CO_2- saving potential in t/a: **103.9**
Date of implementation: **January 2019 – July 2019**

Reducing district heating auxiliary heat exchanger energy consumption

Topic: Cogeneration | Combined heat and power plant (CHP)

Energy Manager
Petri Parviainen
Company: Vantaan Energia

ENERGY CONCEPT DESCRIPTION:

The purpose of the auxiliary heat exchanger is to create district heating demand when needed. For example on start ups or heating grid disorders. Water is used as medium, so on below 0°C temperatures exchanger must be kept warm to avoid freezing.

Set point for keeping warm is 15°C, due to leaky valves exchanger surface temperatures were over 60°C during winter time when set point was 15°C.

2.46 km^2 of surface area, energy consumption was ~3 MW during winter 2019.

Problem was not detected due to flow measurement, measuring range being too high. Leaking valves were fixed, and secondary shut off valves were added to avoid following situation in future.

Other development proposals were considered (adding a circulation pump, changing medium to water/glycol, adding better flow measurement to detect leakages, adding more temperature measurements). Fixing leakages and leakage prevention was considered as most cost efficient option.

Energy consumption during winter 2020 has been 400 kW, although median temperatures have been several degrees higher than usually. Better automation is yet to be implemented to avoid heating on above zero temperatures.

Results

Investment in Euro: **20,000**
Cost reduction potential in €/Year: **640,000**
Pay-back time in years: **0.1**
Energy saving potential in kWh/a: **12,000**
CO_2- saving potential in t/a: **1,926**
Date of implementation: **July 2019**

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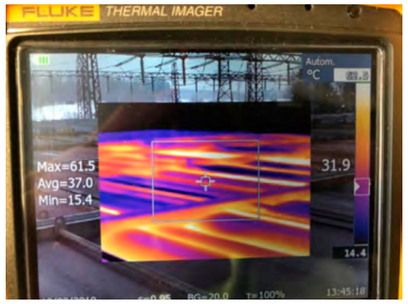

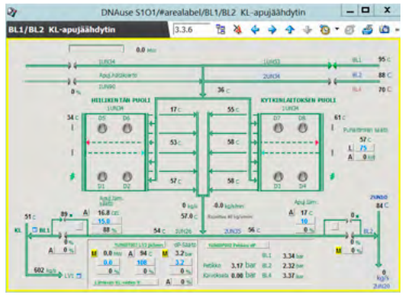

Heating optimisation

Topic: Heating

Energy Manager
Marcus Schmaus
Company: confidential

ENERGY CONCEPT DESCRIPTION:

In rented factory premises, two adjacent halls are each equipped with their own heating systems, each with an oil boiler. These are out of date and very prone to failure. In this project work, the most economical and technically optimal renovation of heat generation is to be worked out.

It turns out that with only one condensing boiler and one local heating pipeline, the best overall concept is also created for the future. Switching to gas as a fuel is expected to result in cost advantages and CO_2 savings.

Results

Investment in Euro: **118,000**
including renovation
Cost reduction potential in €/Year: **7,000**
Pay-back time in years: **1**
Energy saving potential in kWh/a: **67,000**
CO_2- saving potential in t/a: **60**

Optimisation of the ventilation system

Topic: Electrical drives | Process heat | Air conditioning

Energy Manager
Vincenzo Quintieri
Company: confidential

ENERGY CONCEPT DESCRIPTION:

The four ventilation systems of 100,000 m^3/h (1977) in the building have a cold duct and a warm duct. These are used for cooling/dehumidifying in summer and heating/humidifying in winter. They have no heat recovery, only circulating air, controlled by a hygrostat sensor in the cold runner. For optimisation purposes, a circuit system and a CO_2 control are installed in each system. The circulating air can be reused in a controlled manner. At the same time, the electric motors are being replaced by new, efficient EC-motors. The steam generator is calculated accordingly to the new design and is replaced. The steam lances are mounted from the cold runner in the warm runner. These measures result in savings of (energy) 3,460,000 kWh/a, (costs) 669,000 €/a, (CO_2) natural gas 620 t/a and electricity 905 t/a per year. The payback period is 2 years for an investment of € 1,367,500.

Results

Investment in Euro: **1,367,500**
Cost reduction potential in €/Year: **669,000**
Pay-back time in years: **2**
Energy saving potential in kWh/a: **3,460,000**
CO_2- saving potential in t/a: **620 gas & 905 electricity**
Date of implementation: **September 2020**

Heating optimisation

Topic: Heating

Energy Manager
Beate Rußer
Company: confidential

ENERGY CONCEPT DESCRIPTION:

The 21 years existing contracting contract (heat supply) was terminated by the contracting provider on 30th September 2018.

The reasons are, besides problems with the boiler, the supply of 5 houses (1,3,5,7,9) by a central heating system in house number 3. This heating system is oversized; the pipes are partly not insulated. This results in high line losses and a huge technical support effort, as well as a lot of annoyance for the houses to be supplied. Often the users in house number 9 get no more warm water. Compliance with the legal regulations, such as compliance with the Legionella limit, is extremely questionable.

The aim is for each house to have its own heating system, in this case district heating, as CO_2 neutral. Comfort is an extremely important premise. The workload and thus the pure consumption-intensive costs are reduced. The system is secured by a carefree package for the next 15 years through contracting.

Results

Investment in Euro: **0, because it is contracting**
Cost reduction potential in €/Year: **13,000**
Pay-back time in years: **contract period 15 annual costs**
Energy saving potential in kWh/a: **660,000**
CO_2- saving potential in t/a: **147.8**
Date of implementation: **September 2018**

Year 2013

Year 2018

Towards optimising energy efficiency in Aineia WWTP: Energy baseline estimation and EnMS pre-installation study

Topic: Energy data management systems

Energy Manager
Dr. Evgenios M. Karanikolaou
Company: EYATH S.A.

ENERGY CONCEPT DESCRIPTION:

The energy concept aims at the estimation of energy baseline (EnB) in a Wastewater Treatment Plant (WWTP). Accurately forecasting energy consumption in a WWTP is an important strategy for achieving the goal of reducing energy demand and improving energy efficiency. The case study is the study of "AINEIA WWTP", a plant that serves the tourist areas of Thessaloniki, which is located in Angelochori (Thessaloniki area) and supervised by EYATH S.A.

The predictive modelling technique used is linear regression and selecting the appropriate variables before performing regression is a major research challenge. The model - providing us with an accurate starting point we require for an effective energy management system - ended up using 13 different independent variables and a 5-year dataset for the regression. The methodology for improving the adjusted r-squared in regression is presented in detail. Moreover, an Energy Management System (EnMS) pre-installation study in order to monitor and report energy data is also introduced. The overall objective is to initialize the systematic monitoring of energy loads per energy center costs in order to highlight weaknesses and strengths as well as opportunities for targeted interventions, which will eventually lead to energy efficiency improvement of "AINEIA WWTP".

Results

Investment in Euro: **12,800**
Cost reduction potential in €/Year: **2,902**
Pay-back time in years: **4.4**
Energy saving potential in kWh/a: **24,679**
CO_2- saving potential in t/a: **24**
Date of implementation: **foreseen in 2022**

Aineia Wastewater Treatment Plant (Aineia WWTP)

Reduction of energy consumption in the swimming pool recirculation and filtration system, managing the flow, and reduction of energy consumption for lighting in the pool's user area.

Topic: Lighting | Electrical drives

Energy Manager
Pēteris Grundiņš
Company: Olimpiskais sporta centrs, Riga

ENERGY CONCEPT DESCRIPTION:

Reduction of energy consumption in the swimming pool recirculation and filtration system, managing the flow, and reduction of energy consumption for lighting in the pool's user area. The pool was opened 13 years ago. The system has two 11 kW circulation electric motors with water pumps. Motors are worn out and rebuilt several times each. Filtration media were changed in 2018 with lower flow request for better filtration. The existing system is static and doesn't provide flow management with reduced motor power and old circulation pumps rapidly lose their efficiency. Lighting reflectors are worn out and corroded from the aggressive environment in the users' area, and the base components start to fail. Water pumps work 24/7, the lights – 12/7. Reduction of electricity consumption, without sacrificing filtration speed in open hours and replacement of already worn out equipment, reduction of water flow for more efficient filtration at closed hours. Replacement of old fluorescent lighting with LED. New pump assemblies have different placement – there is a need for rebuilding pipe lines, lighting assemblies have corroded reflectors, so the lightning must be changed as a whole unit. Replacement of the existing motor/pump assemblies with new and more efficient ones (IE3/IE4/IE5), flow management by night, replacement of old lamps with new compact design lamps. Brightness sensors and dividing the pool area in separate fields for automatic dimming and light intensity balance. After all optimisation goals are completed, there is reduced electricity consumption, a reliable and modern system, controlled flow for best filtration effect possible. In the end, lower CO_2 consumption in the environment.

Results

Investment in Euro: **27,000**
Cost reduction potential in €/Year: **13,700**
Pay-back time in years: **2**
Energy saving potential in kWh/a: **137,000**
CO_2- saving potential in t/a: **14.4**
Date of implementation: **2020-2021**

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Do you want to learn more about Pēteris Grundins energy concept? Here is the video link:
https://www.youtube.com/watch?v=_7_MQxKUW9Y

Energy efficiency optimisation of Elektrum Energy Efficiency Centre

Topic: Electrical energy

Energy Manager
Rūta Liepniece
Company: AS Latvenergo

ENERGY CONCEPT DESCRIPTION:

The building of the Energy Efficiency Centre is an office building and its area is 693.1 m^2. The building has two floors; on the 1st floor, there are four exhibition halls with demonstration equipment and an administrator's workplace. On the 2nd floor, there is a seminar hall, IT and communication room, workplaces for seven employees, and a rest room for employees with kitchen equipment. The existing energy sources and the type of their use in the facility are as follows:

1) Natural gas used for space heating during the heating season.
2) Electricity used for the office, computer and demonstration equipment.

During the evaluation process of the energy efficiency activities and energy consumption performed so far, it has been concluded that there are still the following optimisation opportunities:

1) Installation of electricity consumption monitoring equipment to evaluate the electricity consumption of ventilation equipment, computer infrastructure and exhibition halls. The potential reduction in electricity consumption is 3,173 kWh per year, or 5% of annual electricity consumption. The preliminary payback period is 6 years & 7 months.
2) UPS replacement. The capacity of the existing UPS has been adapted to ensure the continuous operation of a larger number of employees. The preliminary reduction of electricity consumption when the UPS equipment is replaced is 5,256 kWh or 8.3% of the annual electricity consumption. Payback period is 6 years.

Replacement of ventilation equipment:
The building has two ventilation units and they have not been changed since the building was put into service. Their automation is outdated. Therefore, the pre-set required air exchange is not regularly provided. Thus, the visitors and employees are not provided with a satisfactory level of comfort. The preliminary reduction of electricity consumption, when the ventilation equipment is replaced is 8,515 kWh annually. Payback period is 19 years & 6 months, which is high, but it should be taken into account that the level of comfort of visitors and employees is increased by providing the necessary fresh air exchange. Moreover, the amount of carbon dioxide emissions is reduced.

Results

Investment in Euro: **20,200**
Cost reduction potential in €/Year: **1,694**
Pay-back time in years: **11.9**
Energy saving potential in kWh/a: **16.944**
CO_2- saving potential in t/a: **6.7**

Increasing the efficiency of hot-water boilers in the „Krivi Vir" plant in Nišn

Topic: Heating

Energy Manager
Zoran B. Dordević
Company:
JKP "Gradska toplana" Niš

ENERGY CONCEPT DESCRIPTION:

Aims:
Increasing the usefulness of hot-water boilers in the "Krivi Vir" thermal power plant in Niš by utilizing the heat of flue gases and reducing excess air in the combustion of energy sources.

Base situation:
Two existing 35 MW boilers and one of 58 MW have no regulation of excess air for combustion of natural gas in the burners. In addition to the fact that the boilers run most of their working hours in the condensing mode, at relatively low outside temperatures at higher loads, relatively high exhaust gas temperatures were measured.

Optimisation potentials / Weak points:
High flue gas temperature at boiler outlet.
Unequal excess air ratio, much higher than optimal.

Proposal of solution / Optimisation possibilities:
Installation of utilizers on the smoke ducts of boilers and regulation of excess air by the installation of new O_2 probes.

Effects:
Increasing the efficiency of boilers gives an annual saving of 220,000 €. The investment is 535,000 €. The return on investment is 2 years and 5 months. The reduction in CO_2 emissions is 1,100 tones / year.

Results

Investment in Euro: **535,000**
Cost reduction potential in €/Year: **220,000**
Pay-back time in years: **2.4**
Energy saving potential in kWh/a: **5,000,000**
CO_2- saving potential in t/a: **1,100**

Installation of thermal pump (TP) in business building (BB) Metalac AD for heating/cooling mode

Topic: Cooling | Heating | Air conditioning

Energy Manager
Velisav Dzokovic
Company: Metalac AD/Metalac Cookware

ENERGY CONCEPT DESCRIPTION:

Aims:
Separation of BB from the central heating system, improving the quality of heating/ cooling.

Optimisation potentials / Weak points:
Independent heating/cooling mode of BB, savings - a large number of days with a daily temperature lower than -5 °C (> 15 days) during the winter.

Proposal of solution / Optimisation possibilities:
Installation of TP - we achieve independent heating/cooling and savings.

Effects:
Annual savings are projected at 7,000 €, the investment is 48,700 €, pay-back time is 6.5 years.

Results

Investment in Euro: **48,700**
Cost reduction potential in €/Year: **7,000**
Pay-back time in years: **6.5**
Energy saving potential in kWh/a: **348,400**
CO_2- saving potential in t/a: **83.6**
Date of implementation: **May 2020**

Do you want to learn more about Velisav Dzokovics energy concepts. Here is the video link:
https://www.youtube.com/watch?v=HRGom0Ooc1U

Project for energy efficiency improvements in the industry sector

Topic: Biomass | Solar energy

Energy Manager
Natalia Fonseca
Company: confidential

ENERGY CONCEPT DESCRIPTION:

Development of a project in order to improve the energy efficiency of an industrial building and laboratory building. Both are placed in Alcala de Henares-Madrid region.
The study aims to improve the current air conditioning system in order to reduce non-renewable primary energy and to reduce CO_2 emissions.

The company, which has more than 300 employees, has made a very positive decision to carry out a project to reduce the energy consumption.

For its development, information about the building is collected and the energy simulation of this building is carried out using the Energy Plus programme. Based on the simulation results (load and thermal demand of the air-conditioning system), it is proposed to change the thermal generation systems for the air-conditioning system and use biomass, which is abundant in the area where the building is located.

The new thermal generation system consists of a biomass boiler and an absorption system that provides cooling in summer. Both with their thermal accumulation systems. A photo-voltaic power plant is also proposed to be installed on the terrace of the laboratory building.

Results

Investment in Euro: **720,400**
Cost reduction potential in €/Year: **122,130**
Pay-back time in years: **6**
Additional energy generated from renewable energies in kWh/a: **302,000**
Within the energy concept renewable energies new/additionally installed in MWp: **8.1**
Energy saving potential in kWh/a: **3,600,000**
CO_2- saving potential in t/a: **1,192**
Date of implementation: **February 2021**

Energy efficiency in drying cells

Topic: Process heat

Energy Manager
Juan José Orta Martínez
Company: Saint-Gobain Isover Iberica

ENERGY CONCEPT DESCRIPTION:

The energy concept focuses on studying and improving the energy efficiency of the 3 existing curing stoves in the Isover industry in Azuqueca de Henares.

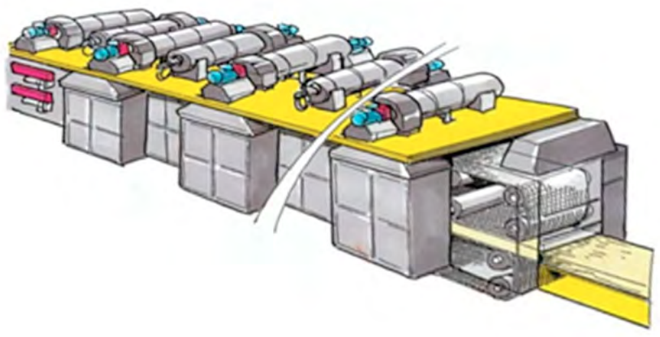
The stoves and heating system of Roca, Line TEL, and Line E are inserted into the production line of the Saint-Gobain Isover plant. Each of them with two perforated pallet conveyors that move the product to an enclosure, consisting of four chambers equipped with a hot air flow generator with a heating zone, a burner and two by-pass chambers. This hot air flow circulates through the product to supply it with the energy required for cooking.

The by-pass cameras allow the direction of the flow through the product to be reversed. The stove assembly consists of 4 or 5 heating zones with independent air circulation, from the input to the output area. This conditioning allows the hot air to be transported inside the enclosure to polymerise the products.

With this heating solution, the energy savings would be 1,575,532 kWh per year and the investment cost more than 59,000 Euros with a payback period of 1 year.

Results

Investment in Euro: **59,720**
Cost reduction potential in €/Year: **55,988**
Pay-back time in years: **1**
Energy saving potential in kWh/a: **1,575,532**
CO_2- saving potential in t/a: **318**
Date of implementation: **November 2020**



Waste heat recovery and carbon footprint reduction project in a Large Scale Industrial Company

Topic: Process heat

Energy Manager
Gürhan Dural
Company: confidential

ENERGY CONCEPT DESCRIPTION:

Aims:
Waste Heat Recovery and energy production (reduce carbon footprint, empower sustainability of environment).

Base situation:
Waste heat left the plant by a chimney without any recovery.

Optimisation potentials / Weak points:
Limited water supply because of environmental legacy rules.

Proposals of solution / Optimisation possibilities:
Waste heat thermal power recovery with organic rankine cycle technology.

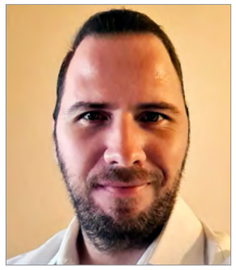
Effects:
Reduce electrical supply amount from grid and empower sustainability of the company.

Results

Investment in Euro: **5,200,000**
Cost reduction potential in €/Year: **2,000,000**
Pay-back time in years: **2.6**
Energy saving potential in kWh/a: **17,791,000**
CO_2- saving potential in t/a: **4,163**
Date of implementation: **2021**

Lighting efficiency project for a supermarket

Topic: Lighting



Energy Manager
Cengiz Ören
Company: Enerjisa

ENERGY CONCEPT DESCRIPTION:

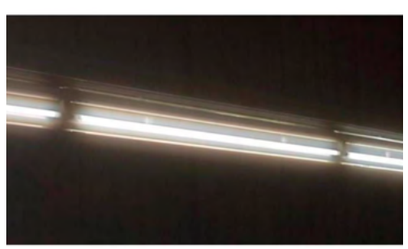
Main object of this project is reducing the electricity use in one of the biggest supermarkets in Turkey. With energy efficiency, another objective is increasing the lighting comfort of all areas in this facility. In existing conditions, lighting fixtures and lighting infrastructure is very old and neglected. A 49 W electronic ballast fluorescent light is used for illumination for 15 years. All fluorescents have lost its lighting (lm/W) efficiency and it is also old technology. These fluorescent's economic life is too short, which is compared with new generation LED lightings. There are two main optimisation potentials in this project. One of these is to provide energy saving and another one is increasing lighting comfort. With this project, facility's lighting infrastructure is also renewed.

The lighting efficiency project should reduce energy consumption of the lighting system. In this project, all existing fixtures are removed, and directions of new lighting lines are located parallel to section corridors. Thus, section corridors lighting level is increased. New lighting fixtures will be selected, LED and this new fixture's illuminance level are much higher than existing technology. Implementation with this project, facility's lighting energy consumption drops to 61% and illuminance level increases from 400 to 1.000 lux (it's guaranteed for 8 years). All of these fixtures are chosen with DALI ballast. It means, all fixtures are connected to main automation system and will be managed by the automation. This automation system regulates the fixtures taking into account customer density in the supermarket.

Main Results:
Lighting comfort; illuminance level increased from 400 to 1.000 lux, all lighting infrastructure is renewed, all lighting systems are controlled by automation, projects IRR is 35.9% and payback period is 4 years.

Results

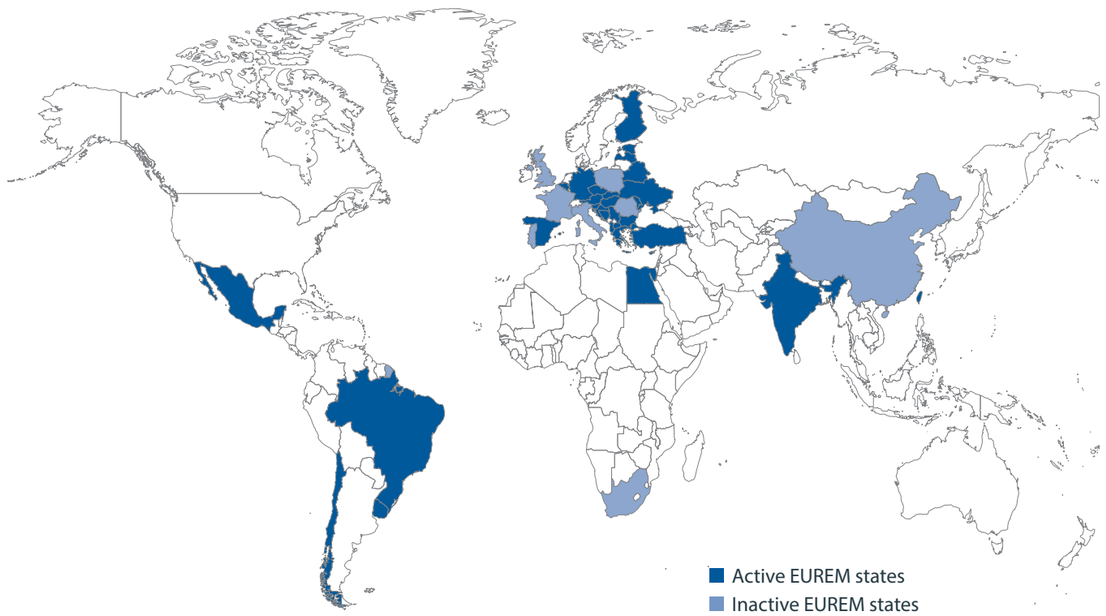
Investment in Euro: **225,135**
Cost reduction potential in €/Year: **55,770**
Pay-back time in years: **4**
Energy saving potential in kWh/a: **663,098**
CO_2- saving potential in t/a: **386.6**
Date of implementation: **foreseen in 2022**



Existing lighting fixtures

New lighting fixtures

Participants of the International EUREM Conference in Berlin, October 2016



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27	Poland	Warsaw	Polish Chamber of Commerce	www.kig.pl			
28	Portugal	Lisbon	German-Portuguese Chamber of Commerce and Industry	https://www.ccila-portugal.com/			
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