European Commission

Information Society and Media Directorate – General

Press Releases and Video Documentation

SmartCoDe

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1 Introduction

The deliverable D-5.3.4 summarizes the SmartCoDe press and video activities between January 2010 and December 2012. It further lists interviews, magazines and books, and appearances on television.

2 Press Releases

2.1 SmartCode Kick-Off (February 2010)

SmartCoDe has issued a press release. The full press release is provided below:

Published: Thu, 2010/02/25

Found at: Pressebox

Contact Person: Neumann, Peter

EU Project SmartCoDe to Develop Local Energy Management Infrastructure with Minimal Consumer Cost Project Supports European Union's "20% Renewable Energy by 2020" Objective

Hannover, Germany - February 22nd 2010 - edacentrum GmbH, today announced the launch of the European Union (EU)-funded Project SmartCoDe. The project's objective is to enable the intelligent management of local energy grids that consist of renewable energy sources such as wind turbines and photovoltaics; energy consuming systems such as lighting, heating, ventilation, and air conditioning (HVAC), appliances such as refrigerators, ovens, and even the battery charger of an electrically-powered vehicle. The project aims to develop the fine-grained communications infrastructure, control and monitoring devices, and associated software, required to meet a consumer price point of less than three Euros per managed device - a level at which surveys indicate consumer willingness to adopt the technology en masse. Successful fulfilment of the project's goals would lend considerable support to the EU's objective of deriving 20 percent of its energy from renewable resources by the year 2020.

SmartCoDe could significantly cut standby energy consumption by up to 10 percent, while residential demand side management could reduce energy consumption by up to 16 percent. This compares very favourably with the 10 percent to 30 percent savings achieved by today's energy management approaches, which are cost-effective only in single, high-consumption commercial sites.

Prof. Dr. Christoph Grimm, SmartCoDe scientific coordinator at the Technical University of Vienna, said "The outcome of this 'think globally, act locally' project will reduce overall energy intensity and simultaneously enable residences and small commercial premises to profit from an open European

electricity market. Moreover, it would further consolidate Europe's position in information and communication technologies".

On the demand side, SmartCoDe aims to schedule the use of energy or to switch energy using products (EuP) into standby, where customer requirements permit. A SmartCoDe system would thus enable individual consumers to participate in the energy market as an intelligently-managed "sub-grid".

On the supply side, SmartCoDe's smart energy management is intended to mitigate or even eliminate local energy grids' unpredictability of supply - an unpredictability that mandates the continued use of the main grid to guarantee supply, especially during peak periods. A significant increase in the predictability of supply would allow local energy grids to participate in the energy market as both consumers and reliable energy suppliers.

Peter Neumann, SmartCoDe overall project coordinator at edacentrum, said "Current energy management approaches are designed for big producers and big consumers. With an energy management cost of hundreds of Euros per managed device, these approaches are out of the question for residential and small commercial needs. The SmartCoDe project aims to reduce the cost of management to a tiny fraction of what it is today".

In addition to the consumer cost factor, SmartCoDe's energy management device is intended to meet three other criteria critical to the successful deployment of advanced energy management techniques in consumer environments, namely:

- A small form factor that integrates readily into as many types of household appliance as possible.
- A wireless communications infrastructure that enables communication and co-ordination between all energy sources, allowing sources to "announce" their availability.
- High-grade data security akin to that of "SmartCard" technology.

SmartCoDe is a 7th Framework Program (FP7) project funded by the European Commission. Its primary mission is to balance and reduce the energy consumption of small buildings and neighbourhoods and pave the way to energy-neutral / energy-positive local grids. The project, which commenced in January 2010, is a three-year Specific Targeted Research Project (STReP) funded under the programme "ICT-2009", in the area "ICT support to energy-positive buildings and neighbourhoods". It includes eight partners from five European countries, with the following responsibilities:

- Ardaco, a.s., Slovakia: Secure data transmission, secure communication
- edacentrum GmbH, Germany: Project coordination, dissemination of results, web portal
- ennovatis GmbH, Germany: Energy management systems

- Infineon Technologies Austria AG: System integration, system-on-chip (SoC), system-in-package (SiP)
- Quiet Revolution Ltd., U.K.: Small-scale energy generation (wind turbines), energy forecasting
- Tridonic Atco GmbH & Co KG, Austria: Lighting and building automation
- University of Novi Sad, Serbia: Energy management software

Vienna Technical University, Austria: Modeling and design of wireless sensor networks

The team's deliverables - which should be complete by the end of 2012 - include:

- Advanced power management methodology
- Abstract models of a local energy cluster, EuP, and decentralised wind turbine
- Executable specification and architectural models of the energy management device (SoC/SiP)
- SmartCoDe demonstration

Energy (wind) generation forecasting methodology

For more information, please see http://www.fp7-smartcode.eu/

About edacentrum

edacentrum is an institution dedicated to promote electronic design automation (EDA) research and development funded by the BMBF (Federal Ministry of Education and Research). It initiates, evaluates and supervises industry-driven R&D projects and offers a comprehensive spectrum of services on all matters concerning EDA, particularly project management of R&D projects. By encouraging EDA cluster research projects and EDA networks, it cross-leverages and reinforces the EDA expertise of universities and research institutes.

edacentrum provides a communication platform for the EDA community; it seeks to inform upper management, the public and the political arena about the central importance of design automation for solving complex system and semiconductor problems, especially those associated with nanoelectronics.

Download:

https://www.fp7-smartcode.eu/press/pressreleases

2.2 SmartCoDe Kick-Off Press Release on weSRCH (2010)

The SmartCoDe Kick-Off press release has been also release on the technology web-portal *weSRCH (www.weSRCH.com).* The press release has been downloaded 1446 times at weSRCH (status Nov. 2012, see figure 2.1 below).

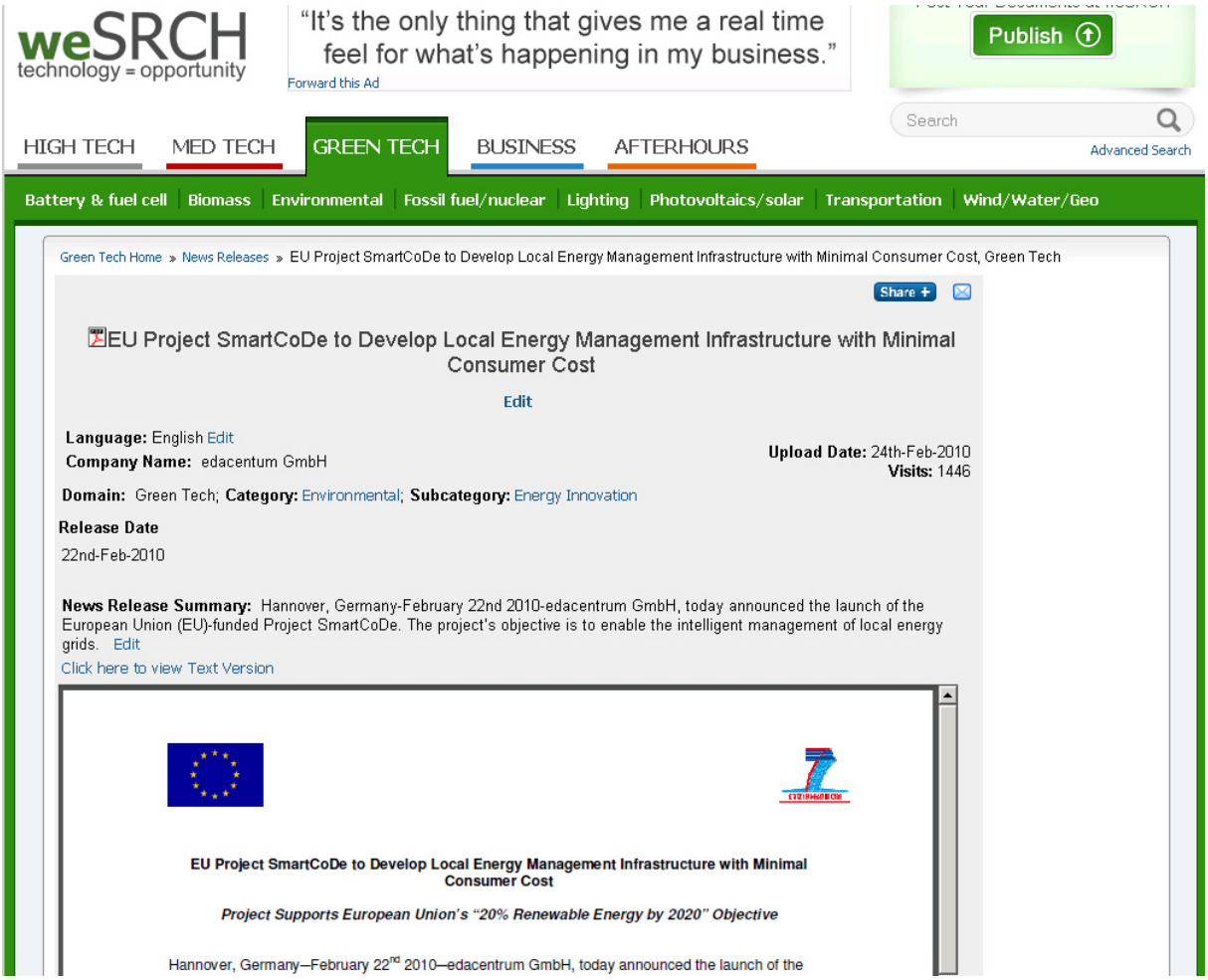


Figure 2.1: SmartCoDe kick-off press release at weSRCH

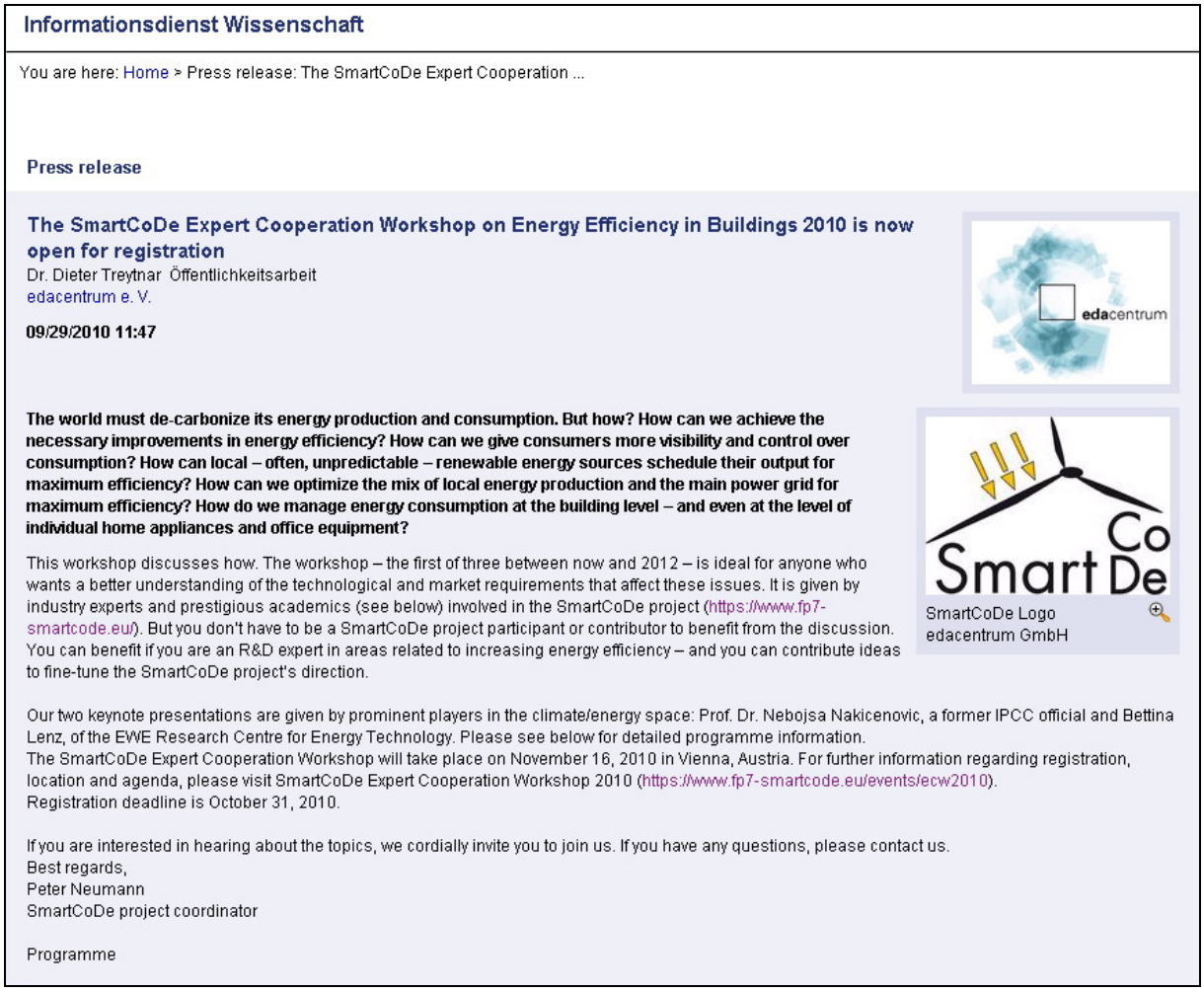
2.3 SmartCoDe Workshop Announcement (September 2010)

In addition to a global mass mailing to industry and academia experts (ECN ~5.000 recipients plus TUV, ENO mailing lists), the SmartCoDe Expert Cooperation Workshop has been announced on the following portals:

- Informationsdienst Wissenschaft (http://idw-online.de/pages/en/news388771)
- OpenPR (http://www.openpr.com/news/146241.html)
- Pressetext.de (http://www.pressebox.de/pressemeldungen/edacentrum-ev/boxid/376580))
- InnovationsReport.de (http://www.innovations-

report.de/html/berichte/seminare_workshops/smartcode_expert_cooperation_workshop_energy_162573.html)

An example of the press releases is provided in figure 2.2. The press release also included the full program which has been left out in figure 2.2.



Informationsdienst Wissenschaft

You are here: Home > Press release: The SmartCoDe Expert Cooperation ...

Press release

The SmartCoDe Expert Cooperation Workshop on Energy Efficiency in Buildings 2010 is now open for registration

Dr. Dieter Treytnar Öffentlichkeitsarbeit
edacentrum e. V.

09/29/2010 11:47

The world must de-carbonize its energy production and consumption. But how? How can we achieve the necessary improvements in energy efficiency? How can we give consumers more visibility and control over consumption? How can local – often, unpredictable – renewable energy sources schedule their output for maximum efficiency? How can we optimize the mix of local energy production and the main power grid for maximum efficiency? How do we manage energy consumption at the building level – and even at the level of individual home appliances and office equipment?

This workshop discusses how. The workshop – the first of three between now and 2012 – is ideal for anyone who wants a better understanding of the technological and market requirements that affect these issues. It is given by industry experts and prestigious academics (see below) involved in the SmartCoDe project (https://www.fp7-smartcode.eu/). But you don't have to be a SmartCoDe project participant or contributor to benefit from the discussion. You can benefit if you are an R&D expert in areas related to increasing energy efficiency – and you can contribute ideas to fine-tune the SmartCoDe project's direction.

SmartCoDe Logo
edacentrum GmbH

Our two keynote presentations are given by prominent players in the climate/energy space: Prof. Dr. Nebojsa Nakicenovic, a former IPCC official and Bettina Lenz, of the EWE Research Centre for Energy Technology. Please see below for detailed programme information.
The SmartCoDe Expert Cooperation Workshop will take place on November 16, 2010 in Vienna, Austria. For further information regarding registration, location and agenda, please visit SmartCoDe Expert Cooperation Workshop 2010 (https://www.fp7-smartcode.eu/events/ecw2010).
Registration deadline is October 31, 2010.

If you are interested in hearing about the topics, we cordially invite you to join us. If you have any questions, please contact us.
Best regards,
Peter Neumann
SmartCoDe project coordinator

Programme

Figure 2.2: SmartCoDe ECWS press release at Informationsdienst Wissenschaft

2.4 SmartCoDe Workshop Press Release (December 2010)

A review of the first SmartCoDe Expert Cooperation Workshop has been releases on Dec 9, 2010. This press release was also used to announce the availability of a free publically pdf online version of the workshop proceedings. The press release is available at:

- Informationsdienst Wissenschaft

  http://idw-online.de/pages/en/news401091

- OpenPress

  http://www.openpr.com/news/154783

- EETiems online

  http://www.eetimes.de/en/eu-project-smartcode-focuses-on-smart-local-energy-grids.html?cmp_id=7&news_id=222905018&vID=209

An example of the press releases is provided in figure 2.3.

Vienna (Austria)/Hannover (Germany), December 9th, 2010 – Bridging the gap between thinking globally and acting locally was one of the key points of the First SmartCoDe Expert Cooperation Workshop held in Vienna (Austria) on November 16th, 2010, organized by the institution edacentrum e.V.. The goal of the European Union (EU)-funded Project SmartCoDe is reducing the overall energy intensity while enabling residences and small commercial premises to profit from an open European electricity market. One of the conclusions of this workshop was that in order to meet the actual challenges on developing affordable smart local energy grids, investing in R&D for clean energy technologies is vital.

SmartCoDe Logo
edacentrum GmbH

On the way to the EU's objective of deriving 20 % of its energy from renewable resources by 2020, the first SmartCoDe-workshop showed that the world must de-carbonize its energy production and consumption. However, the last two centuries of unprecedented development in the world have improved the human condition enormously and at the same time this has resulted in continuous increase of green house gas emissions also reaching other limits of planetary boundaries: Fundamental, game-changing transformations are needed for a shift toward more sustainable development paths.

Prof. Dr. Nebojsa Nakicenovic, International Institute for Applied Systems Analysis of the Vienna Technical University

In his keynote Prof. Dr. Nebojsa Nakicenovic, from the Vienna University of Technology and the International Institute for Applied Systems Analysis of the Vienna Technical University, pointed out that energy systems technologies need to mesh with emerging innovations in energy networks and end use in direction of smart integration: "The emerging new energy systems require two complementary co-evolutions – one is technological and the other institutional. With new technologies and systems, new business models and institutional arrangements will emerge. All of these complementary and co-evolving transformations will require market, regulatory and behavioral changes." The transformational change toward more sustainable futures requires enhanced research, development and deployment (public and private) efforts as well as early investments to achieve accelerated diffusion and adoption of advanced energy technologies and systems: "The longer we wait to introduce these advanced technologies, the higher the required costs and emissions reduction will be as well as the 'lock-in' into the old structures", he concludes.

The SmartCoDe project aims to use electronic system level (ESL) design and verification techniques to devise a System-on-Chip (SoC) or System-in-Package (SiP) design together with an operating infrastructure concept that enables energy monitoring and control at the home appliance level – at a price that consumers can afford.

"A major issue is that renewable energy supplies are unpredictable. With renewable energy contributing an increasing percentage of the total energy supply, it will become a challenge to keep the power grid both stable and cost-efficient", explains Peter Neumann, SmartCoDe overall project coordinator at edacentrum. "Smart energy management in buildings and their environments can mitigate this problem." The SmartCoDe project is looking at the smart integration of local energy neighbourhoods and the grid, including local energy production (LEP) by small-scale distributed energy generation technologies such as wind or photovoltaic.

The workshop – the first of three between now and 2012 – presented not only on-going research in the area of energy forecasting but also actual issues like the hard- and software requirements to implement an automated energy management system. Also a general overview about the security in smart energy grids and security architecture of SmartCoDe network were provided. Since trust is fundamental to attract customers, the reasons for most known incidents were explained and analyzed. This led to a detailed examination of repeated vulnerabilities caused by software flaws, hardware weaknesses and inherited problems like hardware limitations. The summary demonstrated how these experiences affected the architecture of the SmartCoDe network.

Finally, the concept of a 'local energy resource cluster' was presented which consists of the following energy resources (consumers and producers):
- Locally available renewable energies, especially small-scale wind turbines and/or building-integrated photovoltaics.
- Locally available energy storages such as car batteries (plug-in hybrids, electric vehicles).
- Energy using products such as HVAC, electric lighting, consumer electronics, white goods, etc.

Round about 40 attendees took the opportunity to deepen their knowledge together with the experts from the eight SmartCoDe-partners coming from five European countries: Ardaco works on secure data transmission and secure communication. Ennovatis is specialized on energy management systems while Infineon is focussing on system integration and SoC/SiP. Quiet Revolution works on small-scale energy generation like wind turbines and energy forecasting. Tridonic is targeting lighting and building automation. Finally, the University of Novi Sad develops the energy management software while the Vienna Technical University is modeling and designing the wireless sensor network.

The conference proceedings are available free of charge for download at: https://www.fp7-smartcode.eu/events/ecw2010. If a paperback is required, a service charge of 40,-€ is due for payment.

Figure 2.3: Post SmartCoDe ECWS press release at Informationsdienst Wissenschaft

2.5 SmartCode Workshop Press Releases (Aug. & Sept. 2011)

Two press releases have been issued for the 2nd SmartCoDe Expert Cooperation Workshop 2011. In August 2011 the workshop was announced, while in September a change of program and deadline extension was announced.

Links:

- http://www.pressebox.com/pressemeldungen/edacentrum-ev/boxid/442965 SmartCoDe Workshop 2011
- http://www.pressebox.com/pressreleases/edacentrum-ev/boxid/451202

Figure 2.4 shows the initial workshop announcement from August 2011.

Pressbox: edacentrum e.V.

Press releases from this pressbox as RSS Feed Email subscription

Press release BoxID 442965 | All press releases | Company info | All contact persons | Images | Interactive!

2nd SmartCoDe Expert Cooperation Workshop on Energy Efficiency in Buildings 2011

english

Open for registration

SmartCoDe Logo

(PresseBox) Hannover, 26.08.2011, The SmartCoDe project team cordially invites you to join us for the 2nd SmartCoDe Open Expert Cooperation Workshop on October 12, 2011 at the Hotel Westbahnhof in Vienna, Austria. The objective of the workshop is to communicate and discuss the SmartCoDe project's status and progress, particularly:

- The implementation of intelligent energy management methods that enable automatic matching of energy consumption with the available energy supply by reducing energy consumption or switching it between different supplies, both small- and large-scale.

- The development of highly sophisticated renewable energy forecasting methods, for small-scale generation.

"In addition to the project partner presentations – please see https://www.fp7-smartcode.eu/... for the full agenda – the SmartCoDe coordinator, edacentrum's Peter Neumann, is happy to announce that invited papers will be presented by:"
- Prof. Dr. Hermanns of the University of Saarland: Energy Forecasting
- Dr. Djokic of the University of Edinburgh: Energy Management
- Prof. Dr. Boggasch from the Ostfalia Hochschule for Applied Sciences: Energy Storage
Renewable Energy Imperatives

Events in the year since the last SmartCoDe Expert Cooperation Workshop on Energy Efficiency have further emphasized the urgent need to replace traditional energy with renewable energy. However, the issue is not a purely fossil fuel problem. Certainly, carbon dioxide emissions from fossil fuel power plants remain one of the major problems. But the catastrophic Fukushima incident is a reminder that carbon dioxide is not the only concern – we must prepare for the replacement of nuclear energy. If decisions to eventually discontinue nuclear energy generation are not to lead to even greater consumption of fossil fuels, we must dramatically accelerate our development and deployment of renewable energy sources. Failure is not an option.

The shift to renewable energy sources presents us with two fundamental imperatives:
- We must take measures to manage the volatility and unpredictability inherent to almost all major renewable energy sources.
- We must match our future energy consumption to the available supply of (renewable) energy, and not vice versa as it is today.

In addition, we must enable intelligent ("smart") energy nets that allow distributed energy generation and storage, and we must devise efficient energy storage methods, such as pump storage, power-to-gas, batteries, and so on.

SmartCoDe Tackles the Imperatives
The SmartCoDE project focuses on the two imperatives. So what is the status of the project? Much work has been done already – and is ongoing. For instance, the team has completed a board-level prototype of the SmartCoDe chip. The chip will enable communications and control between energy-using products (EuPs), for example, domestic appliances, and an energy management unit (EMU), enabling the latter to control the EuPs according to predefined requirements. Also, an initial version of the EMU software has already been developed.

Further, the SmartCoDe team has established the project's demonstrator in a building in Austria (please see https://www.fp7-smartcode.eu). It has been equipped with a fully-functional EMU that runs the initial version of the new software, additional research equipment from Bosch-Siemens GmbH, one of SmartCoDe's associated partner (https://www.fp7-smartcode.eu/...), a small-scale wind turbine to provide local energy generation, and a board-level prototype of the chip.

This workshop delves into the details – and audience participation is welcome!

Social Media

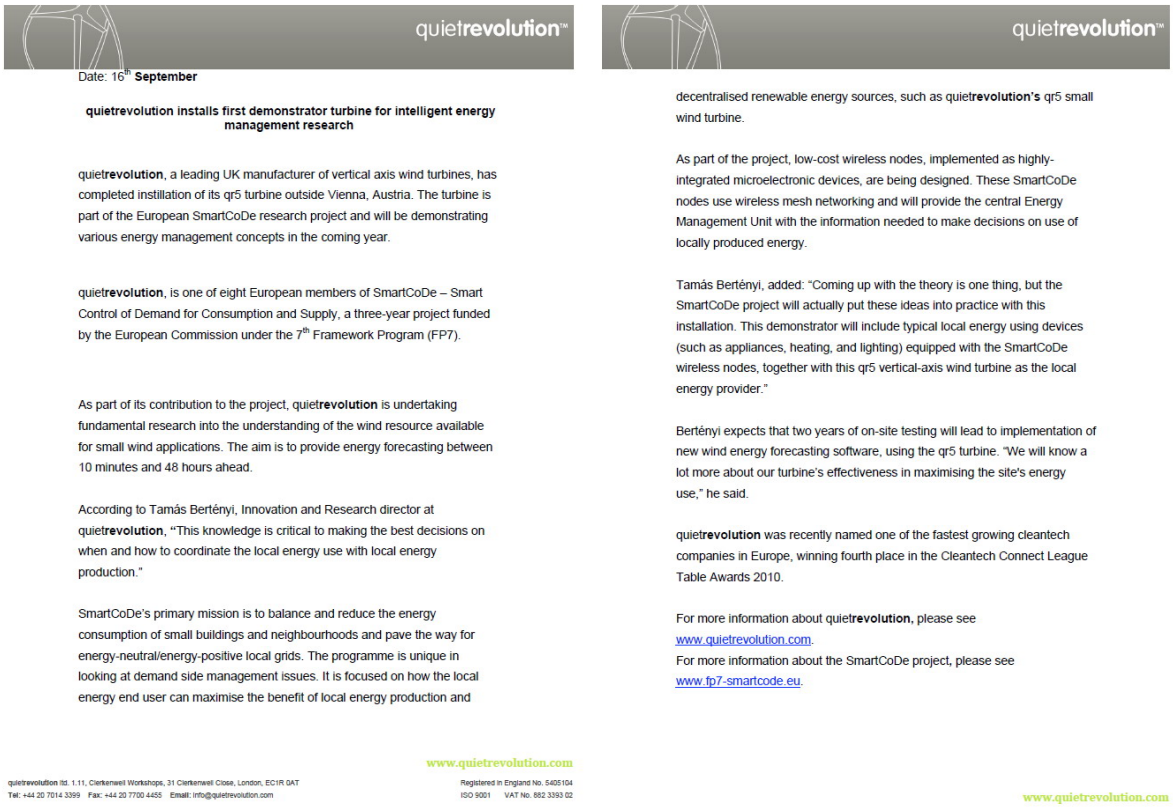
Figure 2.4: SmartCoDe ECWS press release

2.6 SmartCode Turbine Installation Press Release (Aug. 2011)

A press release has been issued for the Wind-Turbine Installation at the SmartCoDe Demonstrator location at Buchberg near Vienna, Austria in Aug. 2011.

Links:

- http://www.quietrevolution.com/downloads/pdf/media/SmartCoDe.pdf



quietrevolution™

Date: 16th **September**

quietrevolution installs first demonstrator turbine for intelligent energy management research

quiet**revolution**, a leading UK manufacturer of vertical axis wind turbines, has completed instillation of its qr5 turbine outside Vienna, Austria. The turbine is part of the European SmartCoDe research project and will be demonstrating various energy management concepts in the coming year.

quiet**revolution**, is one of eight European members of SmartCoDe – Smart Control of Demand for Consumption and Supply, a three-year project funded by the European Commission under the 7th Framework Program (FP7).

As part of its contribution to the project, quiet**revolution** is undertaking fundamental research into the understanding of the wind resource available for small wind applications. The aim is to provide energy forecasting between 10 minutes and 48 hours ahead.

According to Tamás Bertényi, Innovation and Research director at quiet**revolution**, "This knowledge is critical to making the best decisions on when and how to coordinate the local energy use with local energy production."

SmartCoDe's primary mission is to balance and reduce the energy consumption of small buildings and neighbourhoods and pave the way for energy-neutral/energy-positive local grids. The programme is unique in looking at demand side management issues. It is focused on how the local energy end user can maximise the benefit of local energy production and

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ISO 9001 VAT No. 862 3393 02

quietrevolution™

decentralised renewable energy sources, such as quiet**revolution's** qr5 small wind turbine.

As part of the project, low-cost wireless nodes, implemented as highly-integrated microelectronic devices, are being designed. These SmartCoDe nodes use wireless mesh networking and will provide the central Energy Management Unit with the information needed to make decisions on use of locally produced energy.

Tamás Bertényi, added: "Coming up with the theory is one thing, but the SmartCoDe project will actually put these ideas into practice with this installation. This demonstrator will include typical local energy using devices (such as appliances, heating, and lighting) equipped with the SmartCoDe wireless nodes, together with this qr5 vertical-axis wind turbine as the local energy provider."

Bertényi expects that two years of on-site testing will lead to implementation of new wind energy forecasting software, using the qr5 turbine. "We will know a lot more about our turbine's effectiveness in maximising the site's energy use," he said.

quiet**revolution** was recently named one of the fastest growing cleantech companies in Europe, winning fourth place in the Cleantech Connect League Table Awards 2010.

For more information about quiet**revolution**, please see www.quietrevolution.com.
For more information about the SmartCoDe project, please see www.fp7-smartcode.eu.

www.quietrevolution.com

Figure 2.5: SmartCoDe wind turbine installation press release

Local Austrian press has been attending the turbine installation, it was covered in the online magazine of *energie:bau*, please see Figure 2.6 below. The full article is available at:

http://www.energie-bau.at/index.php/betrieb/klein-windkraft-quiet-revolution-am-buchberg/menu-id-74.html.

SMART HOME - 19.08.2011

Klein-Windkraft: Quiet-Revolution am Buchberg

Warum neben einer Aussichtswarte im Alpenvorland plötzlich eine ultraleise Windturbine steht.

Feedback | | More

Errichtung der Windturbine neben der Aussichtswarte am Buchberg.

„Quiet Revolution" nennen sich die Hersteller der vertikalen Windkraftanlage, die vor wenigen Tagen am Buchberg bei Maria Anzbach (NÖ) aufgestellt wurde. Die Londoner Tüftler sind Projektpartner des SmartCoDe-Programmes, dass die möglichst hohe Energie-Autarkie von Einfamilienhäusern erreichen möchte. Dies geschieht einerseits durch die Integration von Windkraft und Photovoltaik, aber auch Solarthermie.

Herzstück des Projektes, an dem 8 Partner arbeiten, ist aber die möglichst effiziente Zusammenschaltung und Steuerung der Verbrauchsgeäte im Haus. Dazu wurde das alte Buchberghaus verkabelt und „verwanzt" – Chips in den verschiedenen Elektrogeräten vernetzen und steuern Einschaltzeiten von Waschmaschine, Elektrogeräten und Beleuchtungskörpern. Das edacentrum in Hannover ist Koordinator, Partner sind u.a. Infineon, Bosch/Siemens, TU Wien oder Zumtobel.

mehr zum Thema

- My Smart Home is My Castle
- Wie wird das Klima? Bisamberg will es wissen
- Kleinwind macht auch Mist
- Energie-Ort Bisamberg
- Abfallsammelzentren werden energieautark

Die Windturbine „Qr5" braucht eine durchschnittliche Windgeschwindigkeit von 5 Metern pro Sekunde, erzeugt 5.000 – 11.000 kWh pro Jahr, ist 5 Meter hoch auf einem 18 Meter hohen Mast. Kostenpunkt: ca. 35.000 – 40.000 Euro.

Beschreibung der Windkraftanlage unter >>www.quietrevolution.com
Fotogalerie von der Errichtung unter >>portal.edacentrum.de
Projekthomepage >>fp7-smartcode.eu

Figure 2.6: SmartCoDe wind turbine installation in the press

2.7 SmartCoDe exhibits at CeBIT 2012 (Feb. 2012)

In late 2011 the SmartCoDe coordinator has been asked to apply for the chance to present the project results at a booth of the European Commission at CeBIT 2012 (312.000 visitors from March 6-10, 2012). The project was chosen on the basis of a booth-proposal submitted in December 2011. Figure 2.7 shows the teaser of the respective press release.

Figure 2.7: SmartCoDe CeBIT 2012 press release

Link: http://www.pressebox.de/pressemeldungen/edacentrum-ev/boxid/487178

2.8 SmartCoDe announces video clip (May 2012)

In accordance to the SmartCoDe Description of Work the project coordinator released a video clip describing the project goals and results to the public (see also chapter 5). The release of the clip was supported by a press release (see teaser in figure 2.8).

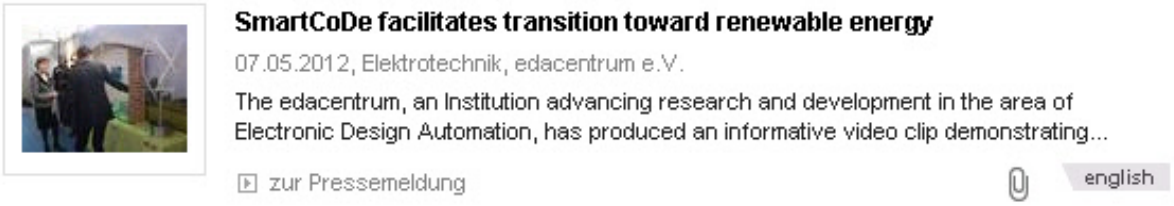


Figure 2.8: SmartCoDe video clip press release

Link: http://www.pressebox.de/pressemeldungen/edacentrum-ev/boxid/506005

2.9 SmartCoDe announces SEBUA participation and SmartCoDe book release (Nov. 2012)

During the SmartCoDe Special Day at the SEBUA symposium in Oct. 2012 a book released by SmartCoDe partners and associated partners was finally release at Springer US (see also chapter 5). The SEBUA participation and the release of the book was supported by a press release (see figures 2.9/10).

Figure 2.9: SmartCoDe SEBUA and book press release at presebox

Link: http://www.pressebox.de/pressemitteilung/edacentrum-ev/Nachhaltige-Stadtentwicklung-mit-effizienten-Energiemanagement-Systemen/boxid/556865

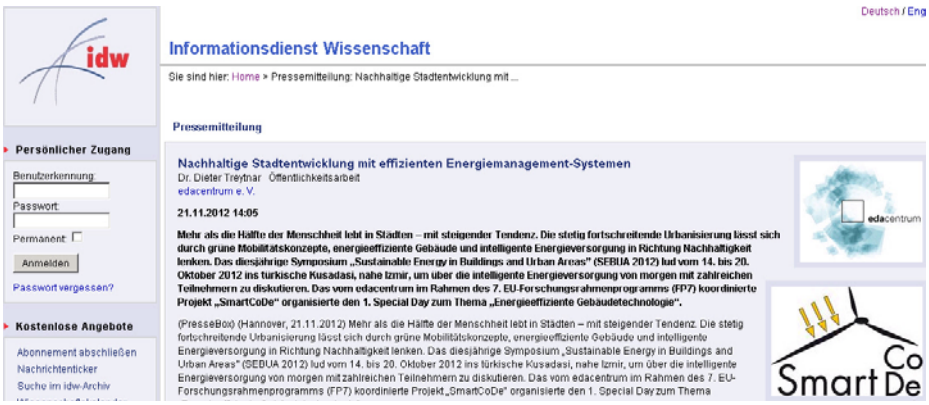


Figure 2.10: SmartCoDe SEBUA and book press release at IDW

Link: http://idw-online.de/de/news508317

3 Interviews

3.1 SmartCode Interview on Pressetext (February 2010)

SmartCoDe Coordinator Peter Neumann has given an interview to the Austrian Web Portal Pressetext. Since the interview has been given in German, it is not displayed here. The full text however can be references at the Pressetext portal:

http://www.pressetext.de/news/100224004/intelligentes-energiemanagement-fuer-haushalte/

3.2 SmartCoDe Interview on SCDsource (March 2010)

SmartCoDe has been interviewed by Bill Murray, Editor-in-Chief, Tech Source Media, Inc., and has been published at SCDsource.

Note: SCDsource at that time had a registered user base of 82.000 subscribers from 85 countries (mostly technical, management ~20%). Later the year the web portal IP was sold and as a result the portal was taken offline. The press release can still be found at:

https://www.fp7-smartcode.eu/press/inthepress

The full interview is provided below:

News Analysis

Consortium to develop smart local grid management SoC/SiP and infrastructure concept

By Bill Murray

03/08/10

The energy saving benefits of the smart power supply grid are well documented. But what about the savings potential of smart *local* energy grids? How much energy can you save by managing and balancing local energy generation with local consumption? And how do you do it? The SmartCoDe project aims to use electronic system level (ESL) design and verification techniques to devise a system-on-chip (SoC) or system-in-package (SiP) design together with an operating infrastructure concept, which enables energy monitoring and control at the home appliance level – and at a price that consumers can afford. We ask the experts how. They are Professor Christoph Grimm (upper photo), chair of embedded systems at the Vienna University of Technology, and co-chair of the Open SystemC Initiative's analog/mixed-signal working group, and Peter Neumann, project manager at edacentrum.

SCDsource: First of all, what is a local energy grid?

Grimm: It is a grid of renewable energy supplies, energy storage systems, and consumers, both in a building and its environment. On the supply side, a building can obtain its power from both the main power grid and local wind turbines or photovoltaics. The energy is consumed by a very wide variety of appliances, such as lighting; heating, ventilation, air conditioning (HVAC); as well as kitchen, bathroom, and entertainment appliances. It can also be consumed by energy storage units such as electric car batteries.

SCDsource: What's the problem that you want to solve?

Grimm: A major issue is that renewable energy supplies are unpredictable. With renewable energy contributing an increasing percentage of the total energy supply, it will become a challenge to keep the power grid both stable and cost-efficient. Smart energy management in buildings and their environments can mitigate this problem. However, using existing technology, the requisite infrastructure is expensive – existing "big iron" systems can achieve these savings cost-effectively only in single, high-consumption commercial sites.

SCDsource: So, how does SmartCoDe intend to solve this problem?

Neumann: It requires highly granular monitoring and control of both energy sources and consumer appliances to enable consumers to schedule energy use in a conservative and cost-effective manner. Cost is the key. Existing management systems run into hundreds of dollars per managed device, so only big energy producers and consumers can cost-justify them. Surveys show that home and office consumers would be willing to adopt the technology if the cost per managed devices falls below about $4.50. So, that's our goal.

SCDsource: And what are the potential energy savings?

Neumann: Smart management of this "neighborhood" grid could cut standby energy consumption by up to 10 percent, while residential demand side management could reduce it by up to 16 percent.

SCDsource: What will a SmartCoDe system look like and what will it do?

Grimm: SmartCoDe will be a small, inexpensive, integrated device that will be embedded in all kinds of appliances. It will have all of the features needed for energy management: power measurement, wireless communication, autonomous power supply for ultra-low standby, and the ability to control the appliance via, for example, a simple serial interface.

Energy management itself will be performed by a central energy management unit that monitors the power grid, local renewable energy sources and storage systems. The unit will be able to monitor the power grid via the power frequency, or over the internet. This would enable grid operators to apply dynamic pricing policies based upon the availability of grid power. So, the energy management unit would use the SmartCoDe infrastructure to help consumers to schedule their power consumption, enabling them to reap the rewards of conservative energy use.

For the public grid, SmartCoDe could at least partially solve the problem of renewable sources' unpredictability of supply. Right now, we still need the public grid to guarantee supply. But if we could increase renewables' predictability – especially around the usual peak periods – it would allow local energy grids to participate in the energy market as both predictable energy consumers and reliable energy suppliers. We might even end up with energy-positive grids – a long-time dream of conservationists. Indeed, a region-wide array of local energy grids might even – one day – be a credible back up in the event of main power grid failure.

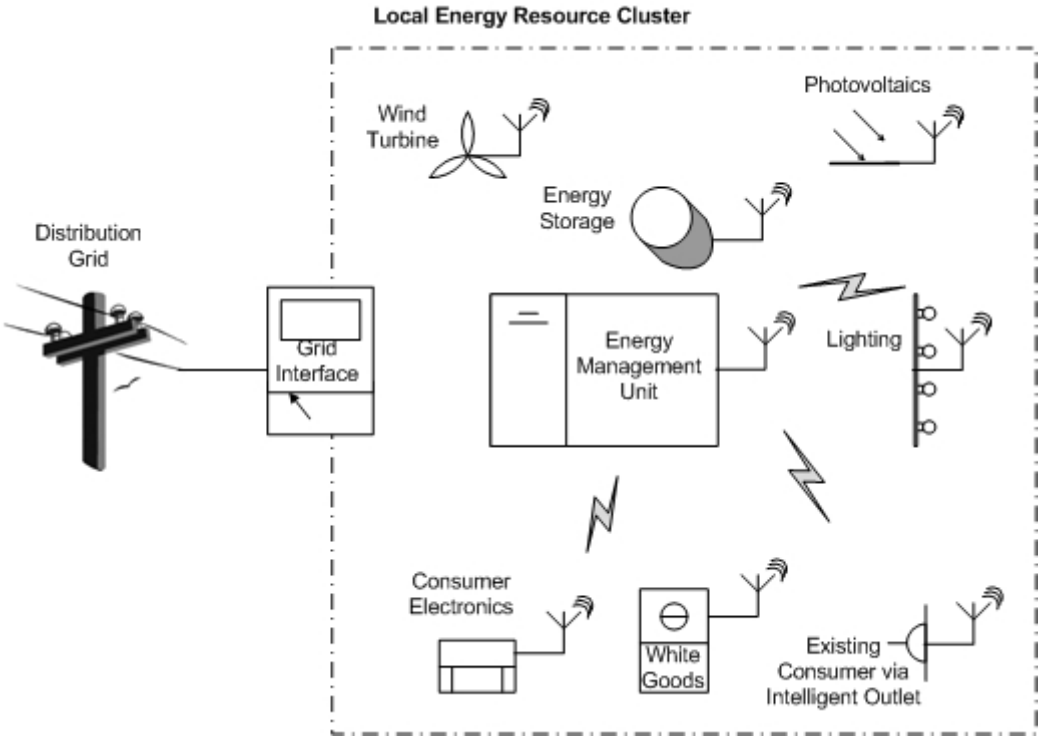


Figure 1: A smart building grid consists of renewable energy sources, storage systems, and consuming appliances

SCDsource: Could someone hack this network and turn my heater off?

Neumann: The system will have robust defenses against malicious attacks and intrusion. Data and command integrity and authenticity are top priority, followed by confidentiality and sophisticated access control. Consumers will accept nothing less.

SCDsource: So, what is the team going to deliver?

Grimm: We want to enable the development of both commercial products and an effective infrastructure. So, we will investigate and evaluate different architectures, and assess their relative technical and economic feasibility. The planned deliverables include:

- A toolkit for modeling and analyzing smart energy grids at various levels of abstraction, written in SystemC, a C++ class library. This includes functional models of a local energy grid consisting of energy-consuming units and a decentralized wind turbine.
- An executable specification and high-level architectural models of an integrated circuit. These will be open source to ensure device interoperability. Implementation is a matter for the device suppliers – it could be a system-on-chip or a system-in-package (SoC/SiP).
- A wind energy forecasting methodology

For validation and verification, we will integrate prototypes in a “living lab.”

SCDsource: That’s a wide range of expertise. Who’s supplying it?

Neumann: There are eight partners in five countries. Ardaco works on secure data transmission and secure communication; ennovatis works on energy management systems; Infineon works on system integration and SoC/SiP; Quiet Revolution works on small-scale energy generation (wind turbines) energy forecasting; Tridonic works on lighting and building automation; the University of Novi Sad develops the energy management software; and Vienna Technical University is modeling and designing the wireless sensor network.

SCDsource: Could you expand on the kind of wireless technologies that are under consideration?

Grimm: We first studied power-line communication. However, wireless communication is much more dependable and less expensive. We will build upon the Zigbee physical and MAC layers as a foundation. However, we'll probably define our own profiles to meet the design goals, especially those concerning costs and information security / privacy.

SCDsource: Could you expand on the kind of sensors that will be used?

Grimm: That has yet to be determined. We are investigating and discussing different means, most notably to measure power consumption.

SCDsource: Who owns the resulting deliverables?

Neumann: The executable spec and high-level architecture of a SmartCoDe node will be public. The project's architectural implementation will remain confidential, but anyone in the public domain can verify their own architectural implementation against the executable spec. The project partner company that generates any particular IP owns it, but will supply it to other project partners under agreed conditions.

SCDsource: When will we see some tangible results?

Neumann: We will build the demonstrator - the Living Lab - at the ennovatis Vienna location in 2011/2012. The demonstrator will include prototype SmartCoDe nodes - probably as a PCB implementation - integrated in household appliances. In the second half of 2012, feedback from the demonstrator will be incorporated into the models, specs, and prototype to establish a stable architecture by the end of the project in 2013.

SCDsource: Many existing home appliances still have a long life expectancy. Can they be retrofitted?

Neumann: Yes. The consumer simply buys a new outlet equipped with the SmartCoDe device. The consumer can set the "identity" of the new outlet – for example, as a fridge – allowing the central management unit to recognize and manage it.

SCDsource: How do you expect deployment to occur: Market forces? Government subsidy? Government edict?

Neumann: It has to be market forces. At this stage, we cannot bet on government action. Maybe, as climate change policies become more solid, energy management systems might well become obligatory at some point. We're promoting market forces from the supply side by involving "associated partners" – partners not directly involved in the project – who will leverage our work to supply the infrastructure and the SmartCoDe device.

SCDsource: Who is funding this development?

Neumann: The European Union. It's an integral part of the EU's "20 by 2020" objective – 20 percent renewable energy by the year 2020.

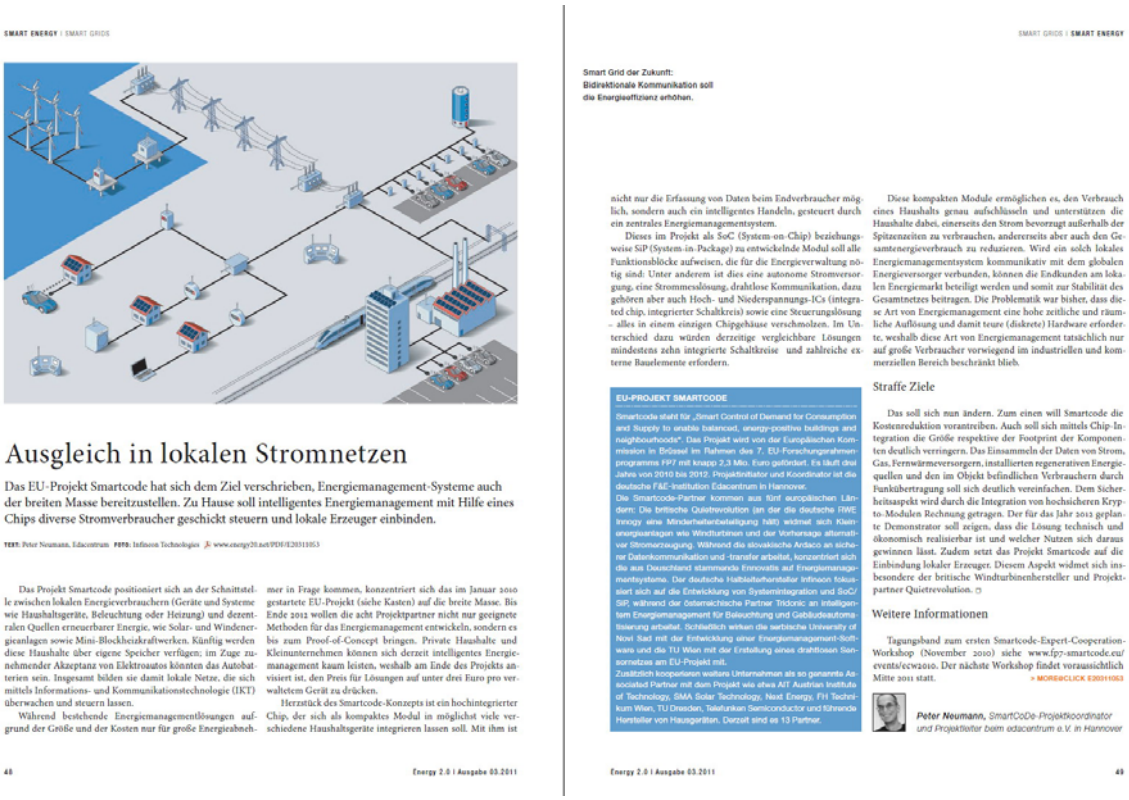
4 Magazines & books

4.1 Energie2.0

In spring 2011 ECN was offered the option to publish an article in the (German) professional (printed) energy journal *energie2.0* (http://www.energy20.net). The article was printed in the 03-edition 2011 and is also available on the net at:

http://www.energy20.net/pi/index.php?StoryID=317&articleID=187887

Please see also figure 4.1 below.



SMART ENERGY | SMART GRIDS

Ausgleich in lokalen Stromnetzen

Das EU-Projekt Smartcode hat sich dem Ziel verschrieben, Energiemanagement-Systeme auch der breiten Masse bereitzustellen. Zu Hause soll intelligentes Energiemanagement mit Hilfe eines Chips diverse Stromverbraucher geschickt steuern und lokale Erzeuger einbinden.

TEXT: Peter Neumann, Edacentrum FOTO: Infineon Technologies www.energy20.net/PDF/E20311053

Das Projekt Smartcode positioniert sich an der Schnittstelle zwischen lokalen Energieverbrauchern (Geräte und Systeme wie Haushaltsgeräte, Beleuchtung oder Heizung) und dezentralen Quellen erneuerbarer Energie, wie Solar- und Windenergieanlagen sowie Mini-Blockheizkraftwerken. Künftig werden diese Haushalte über eigene Speicher verfügen; im Zuge zunehmender Akzeptanz von Elektroautos könnten das Autobatterien sein. Insgesamt bilden sie damit lokale Netze, die sich mittels Informations- und Kommunikationstechnologie (IKT) überwachen und steuern lassen.

Während bestehende Energiemanagementlösungen aufgrund der Größe und der Kosten nur für große Energieabnehmer in Frage kommen, konzentriert sich das im Januar 2010 gestartete EU-Projekt (siehe Kasten) auf die breite Masse. Bis Ende 2012 wollen die acht Projektpartner nicht nur geeignete Methoden für das Energiemanagement entwickeln, sondern es bis zum Proof-of-Concept bringen. Private Haushalte und Kleinunternehmen können sich derzeit intelligentes Energiemanagement kaum leisten, weshalb am Ende des Projekts anvisiert ist, den Preis für Lösungen auf unter drei Euro pro verwaltetem Gerät zu drücken.

Herzstück des Smartcode-Konzepts ist ein hochintegrierter Chip, der sich als kompaktes Modul in möglichst viele verschiedene Haushaltsgeräte integrieren lassen soll. Mit ihm ist

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SMART GRIDS | SMART ENERGY

Smart Grid der Zukunft:
Bidirektionale Kommunikation soll die Energieeffizienz erhöhen.

nicht nur die Erfassung von Daten beim Endverbraucher möglich, sondern auch ein intelligentes Handeln, gesteuert durch ein zentrales Energiemanagementsystem.

Dieses im Projekt als SoC (System-on-Chip) bezeichnungsweise SiP (System-in-Package) zu entwickelnde Modul soll alle Funktionsblöcke aufweisen, die für die Energieverwaltung nötig sind: Unter anderem ist dies eine autonome Stromversorgung, eine Strommesslösung, drahtlose Kommunikation, dazu gehören aber auch Hoch- und Niederspannungs-ICs (integrated chip, integrierter Schaltkreis) sowie eine Steuerungslösung – alles in einem einzigen Chipgehäuse verschmolzen. Im Unterschied dazu würden derzeitige vergleichbare Lösungen mindestens zehn integrierte Schaltkreise und zahlreiche externe Bauelemente erfordern.

Diese kompakten Module ermöglichen es, den Verbrauch eines Haushalts genau aufschlüsseln und unterstützen die Haushalte dabei, einerseits den Strom bevorzugt außerhalb der Spitzenzeiten zu verbrauchen, andererseits aber auch den Gesamtenergieverbrauch zu reduzieren. Wird ein solch lokales Energiemanagementsystem kommunikativ mit dem globalen Energieversorger verbunden, können die Endkunden am lokalen Energiemarkt beteiligt werden und somit zur Stabilität des Gesamtnetzes beitragen. Die Problematik war bisher, dass diese Art von Energiemanagement eine hohe zeitliche und räumliche Auflösung und damit teure (diskrete) Hardware erforderte, weshalb diese Art von Energiemanagement tatsächlich nur auf große Verbraucher vorwiegend im industriellen und kommerziellen Bereich beschränkt blieb.

EU-PROJEKT SMARTCODE

Smartcode steht für „Smart Control of Demand for Consumption and Supply to enable balanced, energy-positive buildings and neighbourhoods". Das Projekt wird von der Europäischen Kommission in Brüssel im Rahmen des 7. EU-Forschungsrahmenprogramms FP7 mit knapp 2,3 Mio. Euro gefördert. Es läuft drei Jahre von 2010 bis 2012. Projektinitiator und Koordinator ist die deutsche F&E-Institution Edacentrum in Hannover.

Die Smartcode-Partner kommen aus fünf europäischen Ländern: Die britische Quietrevolution (an der die deutsche RWE Innogy eine Minderheitenbeteiligung hält) widmet sich Kleinenergieanlagen wie Windturbinen und der Vorhersage alternativer Stromerzeugung. Während die slowakische Ardaco an sicherer Datenkommunikation und -transfer arbeitet, konzentriert sich die aus Deutschland stammende Ennovatis auf Energiemanagementsysteme. Der deutsche Halbleiterhersteller Infineon fokussiert sich auf die Entwicklung von Systemintegration und SoC/SiP, während der österreichische Partner Tridonic an intelligentem Energiemanagement für Beleuchtung und Gebäudeautomatisierung arbeitet. Schließlich wirken die serbische University of Novi Sad mit der Entwicklung einer Energiemanagement-Software und die TU Wien mit der Erstellung eines drahtlosen Sensornetzes am EU-Projekt mit.

Zusätzlich kooperieren weitere Unternehmen als so genannte Associated Partner mit dem Projekt wie etwa AIT Austrian Institute of Technology, SMA Solar Technology, Next Energy, FH Technikum Wien, TU Dresden, Telefunken Semiconductor und führende Hersteller von Hausgeräten. Derzeit sind es 13 Partner.

Straffe Ziele

Das soll sich nun ändern. Zum einen will Smartcode die Kostenreduktion vorantreiben. Auch soll sich mittels Chip-Integration die Größe respektive der Footprint der Komponenten deutlich verringern. Das Einsammeln der Daten von Strom, Gas, Fernwärmeversorgern, installierten regenerativen Energiequellen und den im Objekt befindlichen Verbrauchern durch Funkübertragung soll sich deutlich vereinfachen. Dem Sicherheitsaspekt wird durch die Integration von hochsicheren Krypto-Modulen Rechnung getragen. Der für das Jahr 2013 geplante Demonstrator soll zeigen, dass die Lösung technisch und ökonomisch realisierbar ist und welcher Nutzen sich daraus gewinnen lässt. Zudem setzt das Projekt Smartcode auf die Einbindung lokaler Erzeuger. Diesem Aspekt widmet sich insbesondere der britische Windturbinenhersteller und Projektpartner Quietrevolution.

Weitere Informationen

Tagungsband zum ersten Smartcode-Expert-Cooperation-Workshop (November 2010) siehe www.fp7-smartcode.eu/events/ecw2010. Der nächste Workshop findet voraussichtlich Mitte 2011 statt. » MORE@CLICK E20311053

Peter Neumann, SmartCoDe-Projektkoordinator und Projektleiter beim edacentrum e.V. in Hannover

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Figure 4.1: SmartCoDe energie20 magazine article

4.2 The "SmartCoDe" Book

In December 2010 Christoph Grimm, Stefan Mahlknecht (both then TUV) and Peter Neumann (ECN) signed a contract with Springer Publishers US to edit a book about the SmartCoDe topic, titled "Embedded Systems for Smart Appliances and Energy Management".

The book has been finally released in late Oct. 2012. It has been written by SmartCoDe project partners and SmartCoDe Associated Partners and it contains 8 chapters, spanning topics from smart grids and building management to microelectronics and chip development. Figure 4.2 shows the book's index.

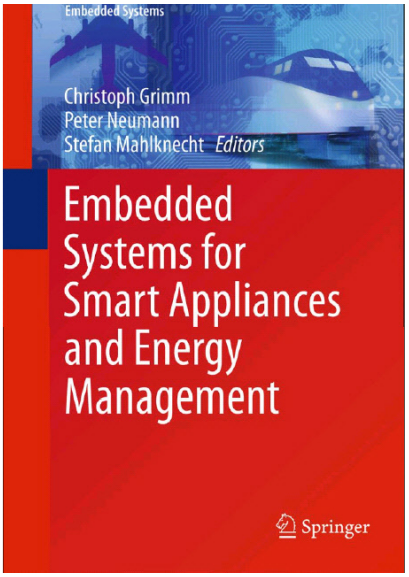

Figure 4.2: The book's index

4.3 edacentrum Newsletter, NÖN, energie:bau

edacentrum GmbH publishes a regular newsletter which is 50-100 pages hardcopy publication with an ISSN number (ISSN 1862 2283), distributed to well over 1000 subscribers. SmartCoDe results have been regularly published in the issues (see also https://www.edacentrum.de/newsletter):

- Issue 01, 2010: SmartCoDe report, project overview (page 30-31)
- Issue 02, 2010: SmartCoDe project report (page 5-7)
- Issue 02, 2010: SmartCoDe project presentation at Design Automation and Test Conference in Europe (DATE 2010) (page 16)
- Issue 02, 2010: SmartCoDe poster session on edaWorkshop 2010
- Issue 01, 2011: SmartCoDe project presentation at edaWorkshop 2011 by Prof. Dr. Christoph Grimm (page 16)
- Issue 02, 2011: SmartCoDe report, wind turbine ramp up at the Buchberg location in Austria (page 25)
- Issue 01, 2012: SmartCoDe presented at CeBIT and release video clip
- Issue 01, 2012: SmartCoDe project in the contents of a Smart Environment, presentation of Prof. Dr. Christoph Grimm at edaWorkshop 2012-11-07


Nachrichten von den Projekten

www.edacentrum.de/projekte

Was hat die Errichtung einer Kleinwindkraftanlage in der Nähe von Wien mit der Mikroelektronik zu tun?

Am 18. und 17. August 2011 war es endlich soweit: nach rund 10 Monaten Verhandlungen um Verträge und Baugenehmigungen, Sicherheitsnachweise und Betriebszulassungen usw., wurde die Kleinwindkraftturbine des SmartCoDe Projektpartners Quiet Revolution Inc. auf der Buchbergwarte in der Nähe von Wien installiert. Das österreichische Bundesdenkmalamt hatte dabei im Vorfeld die Grabungsarbeiten zum Fundament der Windturbine auf diesem denkmalgeschützten Anwesen überwacht und die dabei gefundenen Knochenreste sichergestellt.

Die Windturbine ist Teil des im bewirtschafteten Restaurant und Wohngebäude am Buchberg installierten SmartCoDe Projektdemonstrators, zu dem auch ein vollständiges Energie-Managementsystem des Projektpartners ennovatis GmbH sowie eine neu entwickelte mikroelektronischen Komponente (System-in-Package, SiP) der Technischen Universität Wien und Infineon Österreich gehören. Diese SiP-Komponente soll Eingang in nahezu alle Haushaltsgeräte finden („Energy-using-Products", EuP) und letztendlich zu einem Preis von unter 3 € pro kontrolliertem Gerät auf den Markt kommen. Ein bereits verfügbarer Prototyp wird gegenwärtig zusammen mit Geräten des SmartCoDe assoziierten Partners Bosch-Siemens Hausgeräte GmbH am Standort des Demonstrators getestet.

Die Zielrichtung des vom edacentrum koordinierten Projektes ist das sog. „Local Grid": ein relativ autarkes Kleinstnetzwerk (einzelne bis mehrere kleinere Gebäude), das über ein intelligentes Strommanagement sowohl die Aspekte der dynamischen Anpassung des Energieverbrauchs als auch der lokalen Energieerzeugung berücksichtigt. Diese Netze können aus globaler Sicht entweder als verbrauchendes oder als zuliefernde Kleinstnetz betrachtet werden („Prosumer"). Die Planbarkeit der nutzbaren Windenergie wird dabei durch eine komplexe, an die lokalen Gegebenheiten angepasste Energievorhersage erhöht.

Das Management des Energieverbrauchs ist nicht zuletzt auch deswegen so interessant, weil der Verbrauch sehr schwankt. Dies führt dazu, dass die globalen Energieerzeuger ständig Reserven vorhalten müssen, um diese Schwankungen bei Bedarf aufzufangen (die sog. „Spinning Reserve"). Diese Schwankungen können durch ein Ausbalancieren des Energieverbrauchs und der Energiegenerierung aufgefangen werden. Dabei werden über ein intelligentes Management Verbraucher entweder abgeschaltet, in ihrem Verbrauch reduziert, oder der Verbrauch wird zeitlich verschoben, so dass der Verbrauch in Zeiten mit weniger belasteten Netzen fällt. (Ne)

Weitere Infos zum Projekt SmartCoDe:
SmartCoDe Homepage:
https://www.fp7-smartcode.eu/

Kontrikt (SmartCoDe):
Peter Neumann
fon: (05 11) 7 62 – 1 93 83
coordinator@fp7-smartcode.eu

Buchbergwarte bei Wikipedia: http://de.wikipedia.org/wiki/Buchbergwarte

Seite 25

Figure 4.3: edacentrum Newsletter article example

- Issue 02, 2012: SmartCoDe organizes at special day at SEBUA-2012
- Issue 02, 2012: SmartCoDe releases book on Embedded Systems for Smart Appliances and Energy Management

As an example figure 4.3 shows the article about the SmartCoDe turbine ramp-up in Austria.

The Niederösterreichische Nachrichten (NÖN) published an article about the wind turbine ramp-up in August 2011 (see figure 4.4)

NÖN Woche 34/2011 MARIA ANZBACH 13

Windrad aufgestellt

NEUE ATTRAKTION / Neben dem Buchberg-Schutzhaus wird ab nun Strom erzeugt.

MARIA ANZBACH / Seit vergangener Woche hat der Buchberg eine neue Attraktion: Neben dem Schutzhaus wurde ein 22 Meter hohes Windrad zur Stromerzeugung erreichtet.

Dahinter steht das EU-Forschungsprojekt „Smart Code" mit einem Kostenaufwand von vier Millionen Euro, das von der EU mit rund 2,3 Millionen Euro gefördert wird. Die Errichtung und Aufstellung des Windrades bedeutete für die Techniker eine große Herausforderung: „Wir arbeiten an einem umfangreichen Optimierungsprozess zur Reduktion der Energiemanagementsystemkosten, des Primärenergiebedarfs, des Endenergieverbrauches und der Co2-Reduzierung. Beim Projekt SmartCode geht es unter anderem um die optimalen Nutzung von lokaler Energie Produktion im Zusammenspiel mit EUP´s, die vollautomatisch in Abhängigkeit von kontinuierlichen Tarifänderungen, bei Bezugs- und Einspeisepreis, Wind- und Sonnenenergieproduktion, unterschiedlichen Speichermedienzuständen zu und abgeschaltet beziehungsweise gedimmt und drehzahlgeregelt werden können", erklärt der Projektleiter DI Peter Neumann.

Parallel zur Forschungsarbeit werden Grundlagengespräche in Österreich als auch im Ausland mit Energieversorgern, Wohnbaugesellschaften, Netzbetreibern und Stadtverwaltungen geführt und testen neue Windkraftanlagen, die auch im verbauten Gebiet errichtet werden können. Das Projekt ist das erste in Österreich, in Deutschland gibt es vier.

Spektakulärer Aufbau: Ein 22 Meter hohes Windrad wurde zur Stromerzeugung neben dem Schutzhaus am Buchberg errichtet. FOTO: RIEDL

Figure 4.4: NÖN publication about SmartCoDe wind turbine

The energy efficiency magazine "*energie:bau*" published an article about the wind turbine ramp up in its 04-issue 2011 (see figure 4.5)

GIPV – Wachsende Möglichkeiten s34
Ökostromgesetz für Frühaufsteher s37
Regelungstechnik und Plusenergie s38
Hocheffiziente Bürogeräte s42
Ein Kraftwerk zum Umschnallen s48

&steuerung strom

Mithilfe eines Krans wurde das Windrad am Buchberg errichtet.

Fritz Binder Kraglsteln

Klein-Windkraft: Quiet Revolution am Buchberg

AUTARK „Quiet Revolution" nennen sich die Hersteller der vertikalen Windkraftanlage, die am Buchberg bei Maria Anzbach (NÖ) aufgestellt wurde. Die Londoner Tüftler sind Projektpartner des SmartCoDe-Programmes, das die möglichst hohe Energie-Autarkie von Einfamilienhäusern erreichen möchte. Dies geschieht einerseits durch die Integration von Windkraft und Photovoltaik, aber auch Solarthermie.

Herzstück des Projektes, an dem 8 Partner arbeiten, ist aber die möglichst effiziente Zusammenschaltung und Steuerung der Verbrauchsgeäte im Haus. Dazu wurde das alte Buchberghaus verkabelt und „verwanzt" – Chips in den verschiedenen Elektrogeräten vernetzen und steuern Einschaltzeiten von Waschmaschine, Elektrogeräten und Beleuchtungskörpern. Das edacentrum in Hannover ist Koordinator, Partner sind u. a. Infineon, Bosch/Siemens, TU Wien oder Zumtobel. Die Windturbine „Qr5" braucht eine durchschnittliche Windgeschwindigkeit von 5 m/s, erzeugt 5.000–11.000 Wh pro Jahr, ist 5 m hoch auf einem 18 m hohen Mast. Kostenpunkt: ca. 35.000 – 40.000 €.

Was bedeutet stromautonom?

Island ist seit 2006 zu 100 % mit Geothermie-Kraftwerken stromautonom, Österreich derzeit zu ca. 64 %, hauptsächlich aus Wasserkraft, gefolgt von immer mehr Windkraft. Sollten wir uns also vom Stromverbund Europas abschotten? Nein, und mit stromautonom ist das auch gar nicht gemeint. Es geht um die rechnerische Ziel „Eigenproduktion = Eigenverbrauch" und einen enormen Sicherheitsgewinn. Und zwar mehrfach: Wenn sich ein Land unabhängig von Öl, Gas und Kohleimporten macht, versorgt es sich aus heimischen Energieressourcen, was Devisenabflüsse vermeidet und inländische Wertschöpfung generiert. Weiters wird in Zukunft fossil oder atomar erzeugter Strom sehr teuer werden. Alle Preisprognosen weisen längerfristig nämlich nach oben. Gratis-Primärenergien, wie Wasser, Wind

„Stromautonom" hat mit „Abschottung" nichts zu tun.

Figure 4.5: energie:bau publication about SmartCoDe wind turbine

5 The SmartCoDe Animation and Video

The SmartCoDe project has release an animation outlining the project goals to the public (March 2011), a small video clip showing the wind turbine ramped up at the SmartCoDe demonstrator location at Buchberg, Austria (August 2011), and a video clip explaining project goals and intentions in more detail (March 2012). Animation and videos have been made available on the SmartCoDe homepage as well as on YouTube. On YouTube they have been downloaded more than 1600 times (status Nov. 2012). Figures 5.1 shows the YouTube reference.

Figure 5.1: SmartCoDe on YouTube

6 SmartCoDe on Television

During early 2012 the Austrian television ORF became aware of the SmartCoDe demonstrator setup including the small-scale wind turbine at the Buchberg location near Vienna. ORF indicated interest to broadcast a short report on the project in its regular television program "*konkret*". In late February 2012 they taped the SmartCoDe set and it was broadcasted on ORF2 on March 10, 2012.

Figure 6.1: SmartCode on ORF2

For legal reasons we are not allowed to provide the film on the SmartCoDe homepage. Also for legal reasons the film has only been available at the ORF web library for one week. The film sequence however can be made available to project partners and reviewers by the SmartCoDe coordinator for private use only.