

Position Paper 'Energy'

Executive Summary

In a world where climate change and CO₂ reduction are of a growing importance, it is the innovative capability of IT that can help to solve these problems. Through smart use, IT can help to increase energy efficiency and enable other sectors to reduce their energy consumption. At the same time, because of its intensive energy consumption, the IT sector has to play its part in becoming a green and sustainable sector.

WCIT 2010 will serve as a global platform from which to create awareness and to share knowledge and best practices on the relationship between energy consumption and IT. During a three-day programme, participants will be *inspired* by looking into the future of energy consumption and the role that IT can play in this. IT-enabled *innovations* will be shown, including smart grids, electric cars and green datacenters. WCIT will also present examples of *transition* to a sustainable environment that have been made in business and government.

Besides, WCIT will be the platform where the new European IT policy will be presented to the world.

An Introduction to IT & Energy

Climate change, CO₂ emissions, the environment, finite fossil fuels – all of these issues are in the news every day. The use of IT and its role in everyday life and work is also rapidly increasing. Increasing use of IT has advantages and disadvantages in terms of energy consumption and harmful emissions. The drawback is that total energy consumption by IT facilities in the Netherlands in 2006 was as high as the total energy consumption of 2 million households and CO₂ emissions are comparable to those of the aviation sector. However, the use of IT also means gains can be made through improved efficiency in other sectors and from the benefits of making more intelligent use of energy. Energy and IT are both essential to our modern society and economy and are increasingly interdependent. For these reasons, the Energy and IT theme is a booming business which is high on many agendas. The European Commission is working on the issue in various areas, and businesses and governments in various countries are making plans to address this topic. The issue is also on the agenda in the Netherlands - in fact, on two agendas: the IT-Agenda 2008-2011 and the 2008 Energy Report.

Two main content subjects on IT & Energy have been identified for WCIT 2010:

Better energy efficiency through IT

IT is an important resource for innovation. It can therefore be an effective instrument for energy conservation outside its own sector, where the majority of energy is used. This involves issues such as smart grids (integrating alternative/decentralised energy sources and new forms of services), smart meters (which can reduce energy consumption by households and businesses by offering transparency in current use and smarter use, e.g., by switching off appliances), plug-in hybrid and electric cars, energy-efficient production and IT & Energy in the built-up environment and transport/logistics. Apart from reducing energy consumption, IT also contributes to energy transition through these technologies, by enabling smart, sustainable and decentralised power generation and the associated storage and smart distribution.

Green IT

IT resources and the IT sector consume high volumes of energy. Various studies estimate energy consumption by data centres alone to be about 2%, which is similar to consumption by the aviation sector. The IT sector is also expected to experience above-average growth, which means that its energy consumption will grow quickly as well. This is partly due to the sharp increase in the use of IT applications and the Internet. Efficient IT equipment (at the hardware and software levels) and an 'energy-conscious' IT sector are both important in this. Green IT can also be used to make other sectors greener.

Monitoring & research is another recurring theme in both of the above subjects. The availability and exchange of information is very important to policy formation and discussion of important topics. For example, how will energy consumption by the IT sector develop in the coming years? What are the effects of instruments such as smart grids? What is the place of the Netherlands in the international context? International initiatives to develop monitoring

information have already begun within the EU, OECD and ITU, among others. It is important to continue to expand the amount of available monitoring & research data.

It is also important for energy to be closer to consumers for the collection of usage data. While IT is already in every home in the form of PCs and various peripherals, energy consumption, conservation and sources are not yet truly visible to consumers. IT can contribute and also influence consumer behaviour in order to actually reduce energy consumption.

The **focus** of the WCIT track Energy in terms of content lies on the issue '**Better Energy Efficiency through IT**', i.e., applying IT to conserve energy ('IT as enabler'). This is where the greatest potential energy savings lie and where the innovative power of IT is most needed.

Solutions

Innovative solutions that will be featured during WCIT 2010 include:

- *Green data centres of the future*: in which energy-saving data centres of the future are dealt with in combination with the latest technical developments, such as dynamic infrastructure and cloud computing through to reuse of DC heat. In the Netherlands, a long term agreement (LTA) with the IT sector on energy reductions (MJA) has already been contracted¹.
- *Smart Grids*: which offer possibilities of decentralised energy storage and new services and which are demonstrated particularly on the basis of appealing case studies (electricity/gas/water, etc.).
- *Utility and transport/Smart Buildings*: for example, open E-mobility transaction platforms for electric transport and zero-emission buildings for businesses.
- *Smart citizen/smart cities/smart business*: again based on case studies. Various studies are being conducted/started in Europe to examine what effectively influences human behaviour, aside from technology. Besides transformation of human behaviour, examples of business and government transformations can be shown. Of particular importance are examples that demonstrate successful breakthroughs of institutional barriers, legislation or market boundaries, thus transforming the current situation into a more sustainable one.

Links to other WCIT 2010 tracks

- Mobility (plug-in hybrid and electric cars).
- Sharing space (IT & Energy in the built environment).
- Cybersecurity & Safety (growing online availability of producer and consumer data).

Track design

Principles

- Creating awareness, sharing knowledge and best practices, discussion of policy development and opportunity to show best practices/business cases.
- Participants are from government/policymaking, science, public interest organisations and businesses.
- In business, in addition to the presence of major companies, the presence of small, innovative companies is considered important.
- Commitment can be demonstrated and documented through the 'Declaration of Amsterdam'.

Track deliverables

WCIT is a global platform that can function as a hub for showing countries and organisations interested in IT & Energy what is happening in this area. Because the event takes place in the Netherlands, it gives the country a special opportunity to present itself.

To define deliverables, it is useful to make a distinction between the phase before WCIT, WCIT itself and the post-WCIT phase.

Before WCIT

- Exploring the subject of IT & Energy

¹ In mid-2008, the telecom and data centre operators sector in the Netherlands signed **LTAs** with the government, in which the sector committed itself to achieving an annual improvement of 2% in energy efficiency between 2005 and 2020.

- Forming a cluster of organisations that wish to use WCIT to cooperate and use the event to show something groundbreaking in the field of IT & Energy
- Creating links to other gatherings (e.g., Copenhagen 2009) and other sectors (e.g., IT and Mobility) where useful.

At WCIT

Acquiring Inspiration, exploring Innovation and making plans for transformation, by:

- Knowledge exchange and sharing
- Creating awareness of the issue
- Generating new ideas
- Realising agreements on further cooperation.

After WCIT

- Maintaining momentum for the subject of IT & Energy
- Creating links with gatherings occurring after WCIT (including the next WCIT).

Track participation

The IT & Energy track is set up in a track committee with participation by IT vendors, user organisations, the academic world and governments.

European Component

The European Commission is currently preparing the IT policy agenda for the years to 2015. This agenda will be the successor of the i2010 agenda and provides direction for IT policy for the next five years. At the WCIT, the new IT policy will be presented to the world.

Sweden, which currently holds the EU presidency, has completed an independent study, the eUnion², which provides direction for the final IT policy agenda. The eUnion will be discussed at the i2010 Presidency conference in Visby (9/10 November). After that meeting, the final agenda will be drawn up and will be ready around April 2010.

For the time being, the eUnion provides a good overview of the subjects which are of importance for the European Commission. One of the cornerstones of the eUnion is the role that IT can play in realizing a *sustainable low-carbon economy*. IT can be a major solution to the problems of energy consumption by enabling energy efficiencies in other sectors. The IT sector could deliver reductions in CO₂ emissions five times larger than the total emissions from the entire IT sector in 2020 (Climate Group, 2008). Because of the growing energy consumption of IT there is also a great need for 'Green IT' solutions, particularly for small electronic devices and corporate data centres. Understanding the consequences of behaviour through monitoring of energy consumption and emissions will be another important topic.

The policy goals in the eUnion strategy on this theme are:

- Application of IT in energy saving roles across all relevant industry sectors.
- Ensuring that IT is used in more sustainable behaviour patterns by citizens and businesses.
- EU production of 'Green IT' products, with new technologies and usage patterns.

For implementing policy, two basic principles are followed. The first policy principle is that the EU's *IT sector must demonstrate leadership on climate change* while EU and Member States *governments must provide the optimum regulatory context*. The second principle is that green IT should also represent an economic boost for Europe – an opportunity for a '*Green New Deal*'.

eUnion and WCIT2010

The WCIT will be the platform where the new i2010 policy agenda will be presented to the world. Therefore it is important that the key issues of this agenda are aligned with the key issues of the IT & Energy track. The main issues (IT for a better energy efficiency and Green IT) in the IT & Energy track and the eUnion strategy are identical. Furthermore, both address the role that IT can play in monitoring energy consumption and the influence this has on the behaviour of consumers and businesses.

² eUnion draft version for discussion 090713

Declaration of Amsterdam

The Declaration of Amsterdam can be used to further integrate the goals of the IT & Energy track and the new i2010 strategy. For example, the Declaration can be a useful instrument to commit both private and public organisations to realising ambitious energy reductions within their own organisations. Because the Declaration is in principle a product of all the WCIT tracks, the final content of this declaration needs to be developed in more detail, in close corporation with the EU and the other tracks of the WCIT.

Conclusion

When combining IT & Energy, we can create opportunities for energy efficiencies in and through IT. The WCIT 2010 will present state-of-the-art examples in the field of IT & Energy, including smart grids (for integrating alternative/decentralised energy sources, peak sharing, storage and new forms of service), plug-in hybrid and electric cars and energy in the built-up environment and transport/logistics. Furthermore, raising energy-awareness in the IT sector can help to make the sector a reliable partner in for tackling the problem of a growing energy consumption and CO2 emissions. The goal of the WCIT is to inspire visitors by showing examples of IT-enabled innovations and demonstrate best practices of businesses and governments that are working to reduce energy consumption.