



Programmes to support Energy Efficiency at Intel Ireland

Kevin Geoghegan
Intel Ireland

Intel Ireland Campus



- Over 4,000 people work at the Intel campus in Leixlip.
- Four semi-conductor, wafer-fabrication facilities: Fab 10 and Fab 14, which operate jointly as Ireland Fab Operations (IFO), and Fab 24 and Fab 24-2 which operate jointly as Fab 24.
- These facilities produce latest generation silicon microprocessors that power platforms and technology advancements which are essential to the way we learn, live and work today.

A long history

“It’s no longer enough to just produce a profit. Instead, we need to continually improve our manufacturing process, thereby **reducing our burden on the environment** and becoming **an asset to the communities** in which we live and work”.



Gordon Moore, Intel Chairman
Letter in EHS Report, January 1995

Energy-Efficient Performance.

Consistent environmental commitment—it's part of everything we do. From our eco-smart product design to our environmental partnerships, the environment informs and drives our business.



Responsible product design

Energy efficiency, outstanding performance, and innovative materials are all essential to Intel's eco-smart product designs.

Sustainable operations

At Intel, our commitment to continuous improvement is integrated into our programs, which are designed to drive more sustainable operations in our facilities. We encourage our employees to not only participate in but also to create new eco-focused programs.

Global citizenship

Our commitment to the environment transcends our facilities. We partner with key community, industry, government, and environmental organizations around the world. The challenges are bigger than any one company can solve, but together we can make a difference.



Reducing global energy use. By 2010, Intel and the Climate Savers Computing Initiative's goal is to reduce computer CO₂ emissions by 54 million tons per year, equal to the annual output of 11 million cars or 10–20 coal-fired power plants.



Developing more energy-efficient platforms. Developing more energy-efficient platforms. Intel is working with the EPA's ENERGY STAR and Climate Leaders to reduce emissions and increase energy-efficiency in computing.



Lowering power consumption. Intel is working with the Green Grid to provide new data centre designs that help businesses save money on energy costs while helping to reduce energy consumption around the globe.

Energy Efficiency actions

- Since commencement of operations in Ireland in early 1990's implementation of energy efficiency improvements have been part of day to day activity
 - Examples
 - Challenge setpoints, modes of operation.
 - Identify idle/standby loads, spare capacity, unnecessary flushing and false loads
 - Fab 24 uses waste heat from cleanroom and office block that would otherwise go to atmosphere to provide heating through heat recovery chillers
 - Determine the critical energy need – when, how much and for how long



Energy efficiency support.

- Dedicated energy conservation funding for implementation of energy projects.
 - Once within positive 5 year Net Present Value
 - Technical White Paper approval
- Employees create, prove and implement their innovations, which are then proliferated through a white paper process to other manufacturing sites.
- Get the right people talking to each other
- Information sharing within and between sites

Energy Agreements Benefits

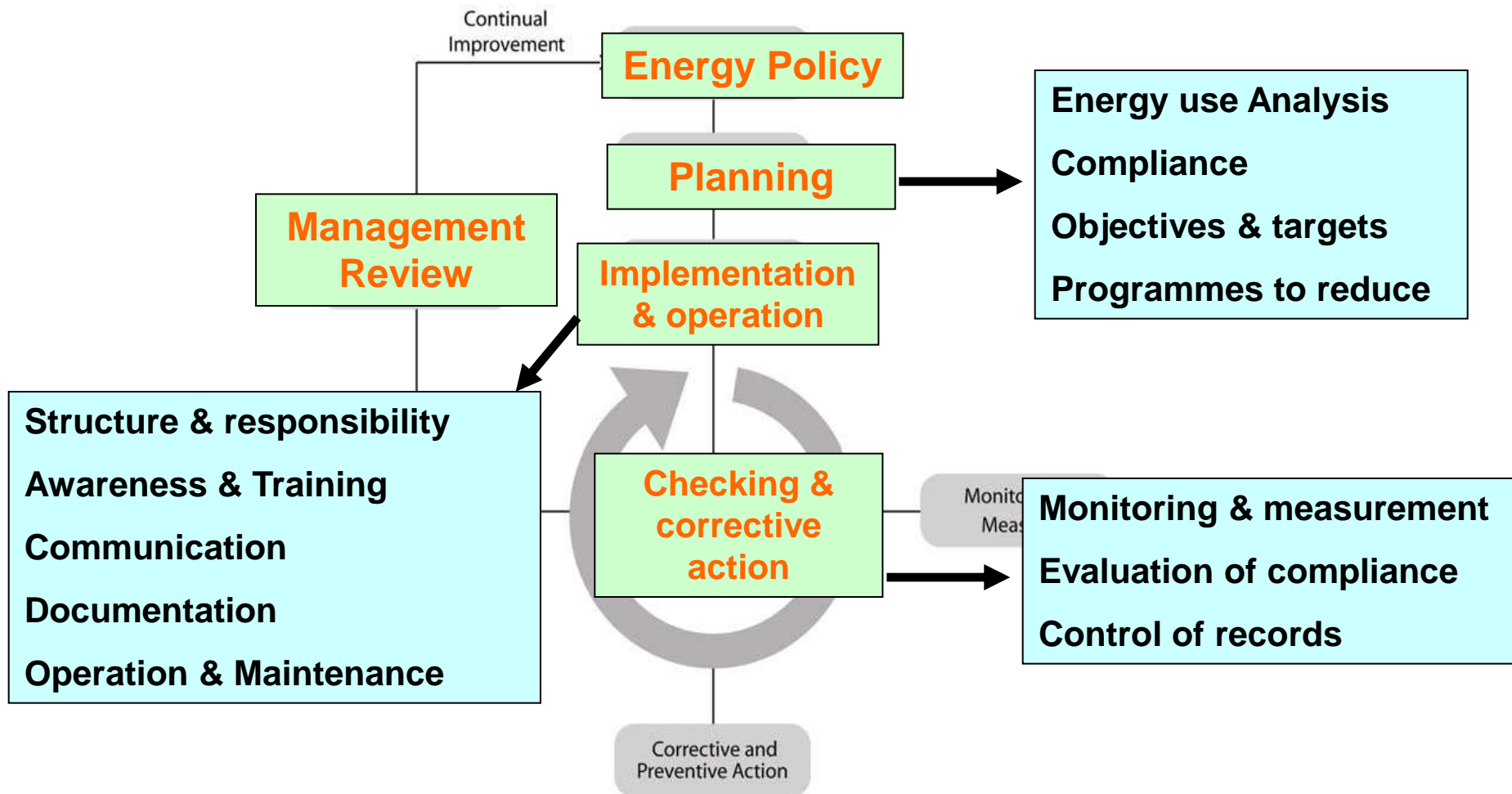
- Shared journey with other companies to achieve IS393 Energy management standard
 - Developed Technical guideline to support standard
 - Identified gaps for information sharing
 - Worked with SEAI to identify sharing initiatives
- Joint solutions e.g. Intel/Pfizer Refrigeration study
[http://www.seai.ie/Your Business/Large Industry Energy Network/Industrial Best Practice Initiative/Industrial Best Practice - Intel Pfizerfinal.pdf](http://www.seai.ie/Your_Business/Large_Industry_Energy_Network/Industrial_Best_Practice_Initiative/Industrial_Best_Practice_-_Intel_Pfizerfinal.pdf)
- Access to best practice through working groups
 - Compressed Air, HVAC, Energy Efficient Design, Chilled Water
- Training opportunities for employees
- Increased visibility to senior management



Energy Management Standard IS 393 / EN16001

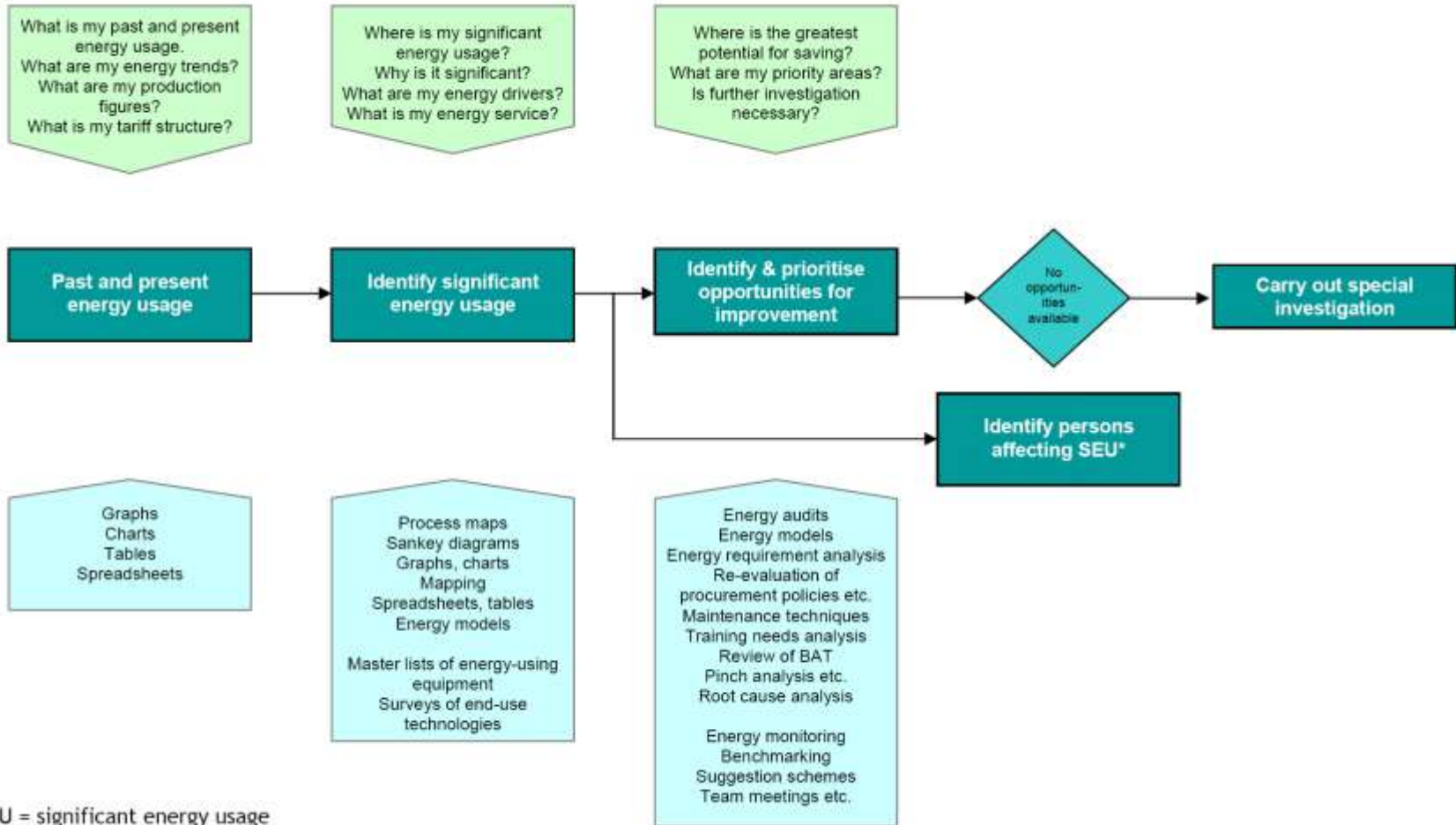
Combining elements of programmes into system

Plan – Do - Check - Act



IS393 - Planning

• 4.3.1 Review of energy aspects



*SEU = significant energy usage

IS 393:2005 Technical Guideline (December 2006)



Evolution

- Community school projects and awareness programmes
- Employee projects as part of further studies in energy management and renewable energy
- Sponsored Energy PhD Research projects
 - Building modelling, UPW Exergy, Process energy driversDublin City University, National University of Ireland Galway





The I2E2 Centre

Innovation for Ireland's Energy Efficiency

- A cross sector research consortia from some of the leading employers in Ireland
 - **Founding Members:** Intel Ireland; Johnson & Johnson – Depuy, Hewlett Packard; Aughinish Alumina; Pfizer; Xerox; Analog Devices
- Industry led research initiative in partnership with academic research institutions.
- Provide value-adding solutions which significantly improve energy efficiency across industrial sectors - Pharmaceutical, Biomedical, Industrial, ICT sectors
- Maintain a flow of innovations in order to help Europe and Ireland's manufacturing industry to sustain its competitive position for the foreseeable future.
- Enable Ireland's manufacturing sector to reduce costs through energy-related efficiency improvements, on a sustainable basis.
- Develop initiatives with the potential to mitigate global trends of fossil fuel depletion and higher energy costs.
- Extend in Ireland the pool of expertise in energy efficiency.
- Promote reductions in the carbon footprint of Irish manufactured products through the promotion and adoption of the latest energy-efficiency technologies.

Legal Disclaimer

- INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL® PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER, AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. Intel products are not intended for use in medical, life saving, or life sustaining applications.
- Intel may make changes to specifications and product descriptions at any time, without notice.
- Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined." Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them.
- The Intel® Core™ Microarchitecture, Intel® Pentium, Intel® Pentium II, Intel® Pentium III, Intel® Pentium 4, Intel® Pentium Pro, Intel® Pentium D, Intel® Pentium M , Itanium®, Xeon® may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.
- Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.
- This document contains information on products in the design phase of development. Do not finalize a design with this information. Revised information will be published when the product is available. Verify with your local sales office that you have the latest datasheet before finalizing a design.
- All dates specified are target dates, are provided for planning purposes only and are subject to change.
- All products, dates, and figures specified are preliminary based on current expectations, provided for planning purposes only, and are subject to change without notice.
- Intel and the Intel logo is a trademark or registered trademark of Intel Corporation or its subsidiaries in the United States and other countries.
- *Other names and brands are the property of their respective owners.
- Copyright © 2008, Intel Corporation