



## EuP Ecodesign Study, Lot 3 Computers and Monitors

- IVF Industrial Research and Development Corporation
- TCO Development
- IVL Swedish Environmental Research Institute

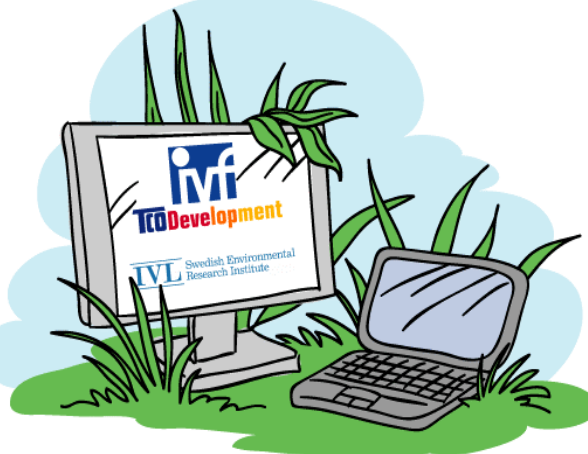
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## EuP Ecodesign Study, Lot 3 Computers and Monitors



31 M:

Anna Karin Jönbrink

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## Programme

09.30	<b>Registration and coffee</b>	
10.00	<b>Opening of meeting</b>	Anna Karin Jönbrink, IVF
10.15	<b>Presentation of the study and the consortium</b>	Anna Karin Jönbrink, IVF
11.00	<b>Product definition, test standards, legislation, voluntary agreements</b>	Ulrika Bergman, TCO Anna Karin Jönbrink, IVF ???
11.30	<b>Economic and market analysis</b>	Jan Sjögren and Per Kilbo, IVF
12.00	<b>Lunch</b>	
13.00	<b>Discussion about the results so far, and about further work in the project</b>	All
13.30	<b>Discussion about contribution from stakeholders, content and form</b>	All
14.30	<b>Coffee</b>	
15.00	<b>Summary of the meeting</b>	Anna Karin Jönbrink, IVF
15.30	<b>End of meeting</b>	

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## EuP directive (2005/32/EC)

Directive 2005/32/EC of the European Parliament  
and of the Council

dated 6 July 2005

Establishing a framework for the setting of  
ecodesign requirements for energy-using products  
and amending Council Directive 92/57/EC and  
2000/55/EC of the European Parliament and of  
the Council

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## Energy-using products

- Products using energy during the use phase of the life cycle
- Not transports
- Significant volumes within the European Union
  - Product groups of at least 200 000 pieces a year
- Significant environmental impact
- Significant potential for improvement
  - Lack of legislation and not enough voluntary agreements
  - Big difference in environmental impact from products providing the same function

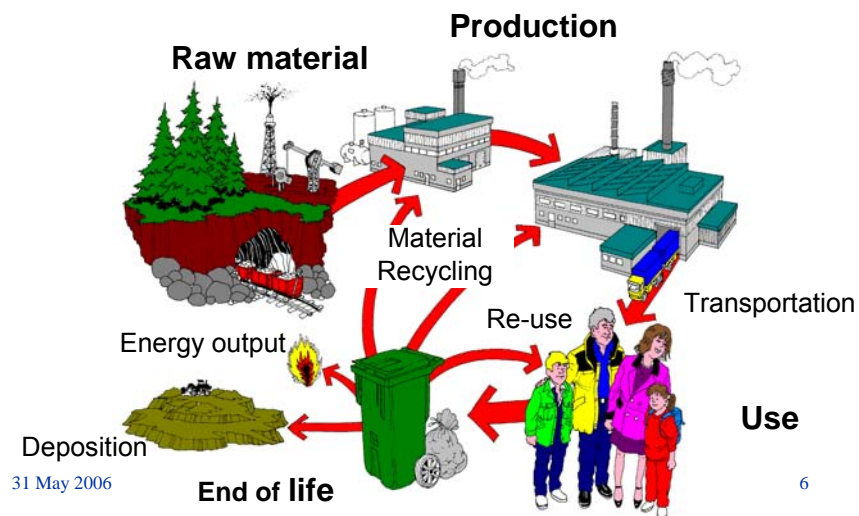
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## Ecodesign and Life Cycle Thinking



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## EuP work progress (from the Commission)

- EuP Directive (2005/32/EC): July 2005
- Call for tenders for preparatory studies
  - Objective, to find out whether and which eco-design requirements could improve its environmental performance throughout its life cycle.
- Preparatory studies: 2006-2007
- Creation of the Consultation Forum: end of 2006
- Creation of the Regulatory Committee: Q3 2007
- Adoption of the EuP Working Plan by July 2007
- Transposition of the EuP framework Directive by the Member States by August 2007
- First implementing measures: end of 2007

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## 14 preparatory studies

[http://ec.europa.eu/energy/demand/legislation/doc/2006\\_tenders\\_list\\_signed\\_en.pdf](http://ec.europa.eu/energy/demand/legislation/doc/2006_tenders_list_signed_en.pdf)

No	Product group	Contractor	Information
1	Boiler and combi-boilers	Van Holsteijn en Kemna B.V.	<a href="http://www.ecoboiler.org">www.ecoboiler.org</a>
2	Water heaters	Van Holsteijn en Kemna B.V.	<a href="http://www.ecohotwater.org">www.ecohotwater.org</a>
3	Personal Computers and monitors	IVF Industrial R&D corporation	<a href="http://www.ecocomputer.org">www.ecocomputer.org</a>
4	Imaging equipment	Fraunhofer Institute for Reliability and Microintegration, IZM, Berlin	<a href="mailto:Karsten.schischke@izm.fraunhofer.de">Karsten.schischke@izm.fraunhofer.de</a>

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## 14 preparatory studies, continued

No	Product group	Contractor	Information
5	Consumer electronics, TV	Fraunhofer Institute for Reliability and Microintegration, IZM, Berlin	<a href="mailto:Karsten.schischke@izm.fraunhofer.de">Karsten.schischke@izm.fraunhofer.de</a>
6	Stand-by and off-mode losses of EuPs	Fraunhofer Institute for Reliability and Microintegration, IZM, Berlin	<a href="mailto:Karsten.schischke@izm.fraunhofer.de">Karsten.schischke@izm.fraunhofer.de</a>
7	Battery chargers and external power supplies	Fraunhofer Institute for Reliability and Microintegration, IZM, Berlin	<a href="mailto:Karsten.schischke@izm.fraunhofer.de">Karsten.schischke@izm.fraunhofer.de</a>

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## 14 preparatory studies, continued

No	Product group	Contractor	Information
8	Office lighting	VITO- Flemish Institute for Technological Research	<a href="http://www.eup4light.net">www.eup4light.net</a>
9	(public) street lighting	VITO- Flemish Institute for Technological Research	<a href="http://www.eup4light.net">www.eup4light.net</a>
10	Residential room conditioning appliances	Armines	<a href="mailto:Philippe.riviere@ensmp.fr">Philippe.riviere@ensmp.fr</a>

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## 14 preparatory studies, continued

No	Product group	Contractor	Information
11	Electric motors 1-150 kW, pumps, circulation fans in buildings and ventilation fans	AEA Technology	<a href="http://www.ecomotors.org">www.ecomotors.org</a>
12	commercial refrigerators and freezers	BIO Intelligence Service	<a href="mailto:Veronique.monier@biois.com">Veronique.monier@biois.com</a>
13	Domestic refrigerators and freezers	Signature of contract soon	
14	Domestic dishwashers and washing machines	Signature of contract soon	

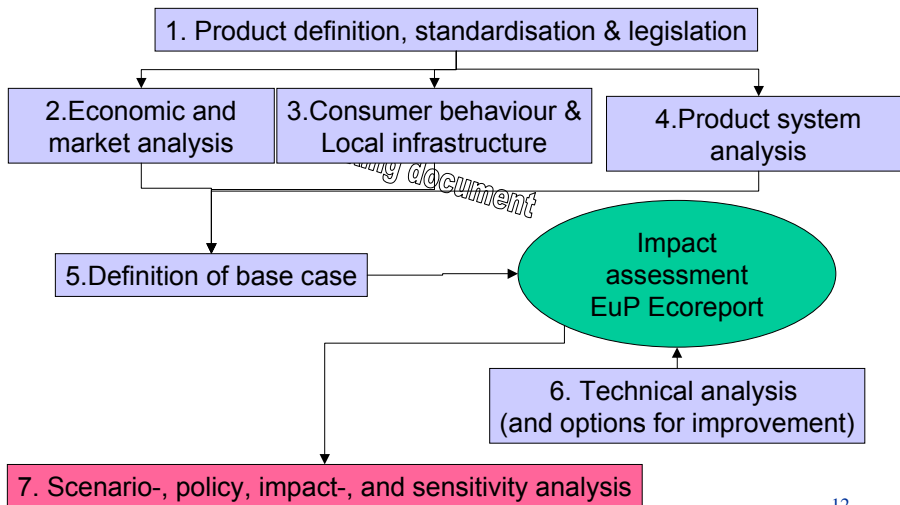
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## VHK- methodology



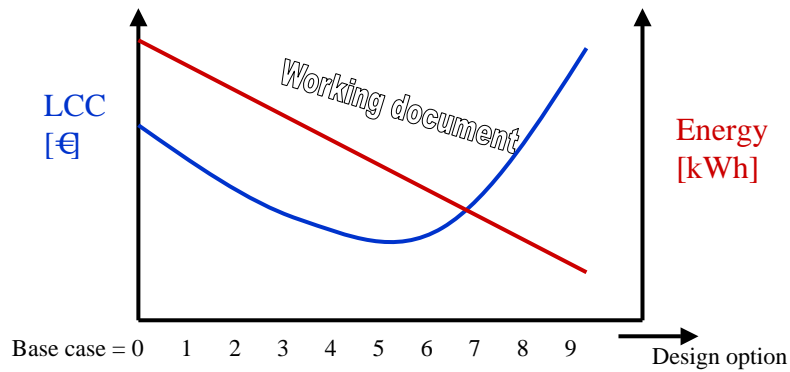
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## Result



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## Product category, Lot 3

- Computers
    - Desktops
    - Laptops
  - Monitors
    - LCD
    - CRT
  - For future products and technologies
    - Possibly other related products
- A diagonal watermark 'Working document' is present across the list.

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## Computers and monitors

- New models quite often
- Environmental impact
  - Materials
  - Production
  - Transports
  - Use
  - End of life
- Can also have a big influence of environmental impact of other products and systems
  - Transport logistics
  - Energy systems

*Working document*

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— ...

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## Stakeholder involvement

- The study must involve "the right" stakeholders such as
  - Member states
  - E I C T A
  - WWF
  - Euro commerce,
  - Orgalime
  - Interested companies
  - ...
- Any stakeholders interested in our study are very welcome to contribute!

*Working document*

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## Website

- All lots will start up a website for their projects, which will be linked to the overall website at the Commission.
  - [http://europa.eu.int/comm/energy/demand/legislation/eco\\_design\\_en.htm](http://europa.eu.int/comm/energy/demand/legislation/eco_design_en.htm)
- They will reflect the progress of work and give a picture of the project to the stakeholders
- Results from sub-steps (VHK-method) will be published
- Invitations to workshops will be published
- Our website **[www.ecocomputer.org](http://www.ecocomputer.org)**

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## Workshop

- Every lot will invite the stakeholders to workshops. The workshops must be open to every interested stakeholder
- Object of the workshops is
  - to give stakeholders opportunities to give their view
  - to include them in the study and in the final report.
  - to get help from Industry in getting data for the study

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## Good result from the study

- The better information we can collect in the study, the better calculations can be done, and the better result of the study.
- Our hope is that the study will become a good base, from which the Commission can build their policy means and measures.

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## This Workshop

- Present the results of the first parts of the study we do have so far, to get your view of it
- Establish contact with you!
  - To get data
  - To give you opportunity to give your View
- Set up methods for cooperation

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**STOP**

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## **Standards and voluntary initiatives**

**Standards**  
Electrical safety  
EMC

**Voluntary initiatives**  
Environmental labels and declarations  
Energy Consumption  
Other environmental performance requirements

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## Electrical Safety

- IEC - International Electrotechnical Commission
- EN - European standard
- UL - American standard
- Similar, consider harmonized

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## Electromagnetic Compatibility EMC

- IEC - International Electrotechnical Commission
- EN - European standard
- FCC - American standard

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## Environmental performance labels and declarations

Three types, International Organization for Standardization (ISO)

- Type I (ISO 14024) a voluntary, multiple-criteria based, third party program. Eco-labels



## Environmental performance labels and declarations

- Type II (ISO 14024) Self-declaration
- Type III (ISO/TR 14025) Environmental Product Declaration, EPD. Quantified environmental data for a product based on the ISO 14040 series of standards (LCA)



## Eco-labels



EU-flower  
(Europe)  
[www.eco-label.com](http://www.eco-label.com)



TCO-label (Global)  
[www.tcodevelopment.com](http://www.tcodevelopment.com)



The Swan  
(Nordic countries)  
[www.svanen.nu](http://www.svanen.nu)



Global Ecolabelling  
Network  
[www.gen.gr.jp](http://www.gen.gr.jp)



The Blue Angel  
(Germany)  
[www.blauer-engel.de](http://www.blauer-engel.de)

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## Energy Star



- US EPA – European Commission 2000
- Self-declaration
- 20 to 25% of the equipment existing on the market at the date the criteria are set.
- Austrian study 2003:  
80 % on Austrian market fulfilled the Energy Star requirements.
- Energy Star conference 2004:  
If only 20 % fulfils the requirements when set,  
65 % fulfills when they come effective.

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## Energy Star PC & Laptop

Energy Star PC & Laptop July 2000	
Maximum Continuous Power Rating of Power Supply	Sleep mode
≤ 200W	≤ 15W
> 300W ≤ 350W	≤ 20W
> 300W ≤ 350W	≤ 25W
> 350W ≤ 400W	≤ 30W
> 400W	10% of the max output rating

PC: 217  
Laptops: 271



## Energy Star – computer draft

Computers Draft 2 (effective July 2007)

- Criteria divided into product types and categories
- Standby (Off Mode), Sleep mode, Idle mode.
- Minimum efficiency of the power supplies used.



## Energy - PC

	<b>The Swan</b> Jun 2005	<b>EU-flower</b> Apr 2005	<b>TCO'05</b> Jul 2005	<b>GEEA*</b> 2006	<b>Blue Angel</b> Feb 2004
<b>Sleep</b>	4W	4W	5W	5W	5W
<b>Off</b>	2W	2W	2W	2W	2W
<b>On (Idle)</b>	-	-	-	70W	-
<b>Labelled products</b>	20	-	-	? Latest update 2002	60

\*Group for Energy Efficient Appliances

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## Energy - Laptop

	<b>The Swan</b> Jun 2005	<b>EU-flower</b> Apr 2005	<b>TCO'05</b> Jul 2005	<b>GEEA</b> 2006	<b>Blue Angel</b> Feb 2004
<b>Sleep</b>	3W	3W	4W	5W	5W
<b>Off</b>	2W	2W	2W	2W	2W
<b>Power Supply*</b>	0.75W	0.75W	-	-	1W
<b>Labelled products</b>	-	-	-	? Latest update 2002	-

\*Not connected to the computer

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## Energy - Displays

	Energy Star Jan 2006	GEEA 2006	TCO'03 Jan 2006	The Swan Jun 2005	EU- flower Apr 2005	Blue Angel Feb 2004
<b>Sleep</b>	2W	With 2.3W	*	*	*	Low power 3W
<b>Off</b>	1W	*	*	*	*	2W
<b>Active mode</b>	X < 1 megapixel, then Y = 23 X > 1 megapixel, then Y = 28X	*	*	*	*	-
<b>Labelled products</b>	464	? **	102	5	-	3

\* Same requirement as Energy Star

\*\* Latest update 2002

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## Top Runner

- Japan, Advisory Committee for Natural Resources and Energy 1999
- Self-declaration
- Targets based on the most energy-efficient products on the market at the date the criteria are set
- Targets set for different product types defined by the system
- Calculate the energy consumption efficiency

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## Other environmental performance requirements - Eco-labels

- Environmental Responsibility
- Environmental hazards
- Preparation for Recycling
- Recycling information
- Guarantee and spare parts
- Energy consumption
- Acoustic noise



## Self-declarations for environmental performance

- IT Eco Declaration (Nordic)  
[www.itecodeclaration.org](http://www.itecodeclaration.org)
- ECMA TR 70 (European)  
[www.ecma-international.org](http://www.ecma-international.org)
- Harmonization between IT Eco Declaration and ECMA TR 70 is currently on-going
- EPEAT (USA)  
[www.epeat.net](http://www.epeat.net)



## **Installed base of computers**

*Working document*

Jan Sjögren IVF  
Per Kilbo IVF

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## **EUP-Computer, installed base in EU-25**

**Data supposed to be derived from EUROSTAT**

**Available register:**

- COMEXT** – Trade-data, from entry into EU
- PRODCOM** - Production and trade from entry into EU

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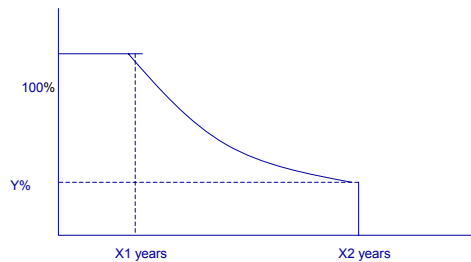


## The installed base:

To get the expansion of equipment we looked to use:

Yearly expansion = production + import – export - scrap

To get the actual installed base we must estimate the distribution of “life-time”, opinions are welcome



X1 = ?

X2 = ?

Y = ?

Shape of curve = ?

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## COMEXT

- No production data
- The classification changes almost every year, making it uncertain to trace the types of equipment we are looking for
- The data we could get was not reliable judging from the curves
- COMEXT will not be used

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TCD **Development**

IVL Swedish Environmental  
Research Institute

## PRODCOM

**PRODCOM basically contains the data we need but**

- **The individual countries are only covered since entry EU**
- **EUROSTAT does not publish production data for countries with few producers (we have not been granted exception)**
- **Some uncertainties concerning codes for “systems” and for “monitors”**
- **As will be seen some of the results are definitely wrong**

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TCD **Development**

IVL Swedish Environmental  
Research Institute

## The results from PRODCOM

**Negative numbers for internal sales, are due to hidden production data**

- **We tried to solve this by measuring the consumption of CPUs compared to production of computers, but no solid pattern was found**
- **To achieve data which are not only guesswork, we need some backup source, also to cover for numerous other “shaky data”**

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## We would like to use EITO statistics

- EITO, which is a branch organization has statistics for desktop and laptop sales
- The data seems more reasonable for most countries, but cover fewer years than needed
- EITO also give predictions for the next 2 years
- To use EITO we need permission from EITO and permission from EU, to use a not stipulated source

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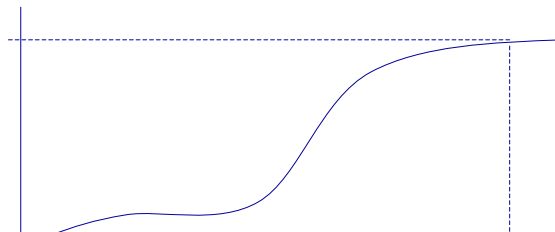
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## Predictions

It is reasonable to believe that the number of computers sold, will asymptotically move towards yearly replacements, once the basic need is fulfilled. When and on what level? , country by country

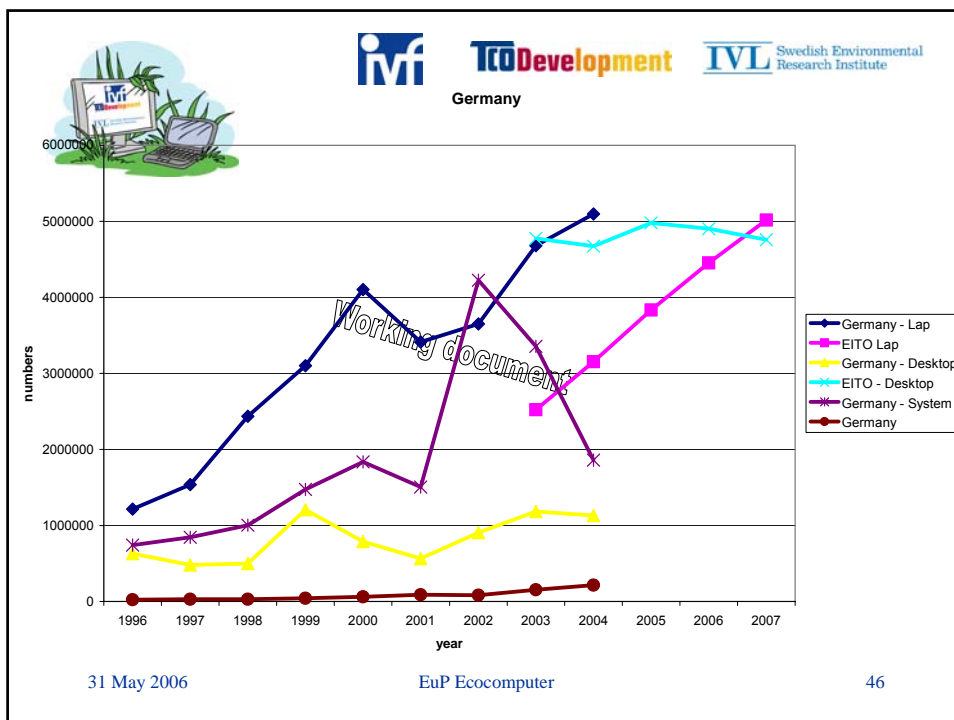
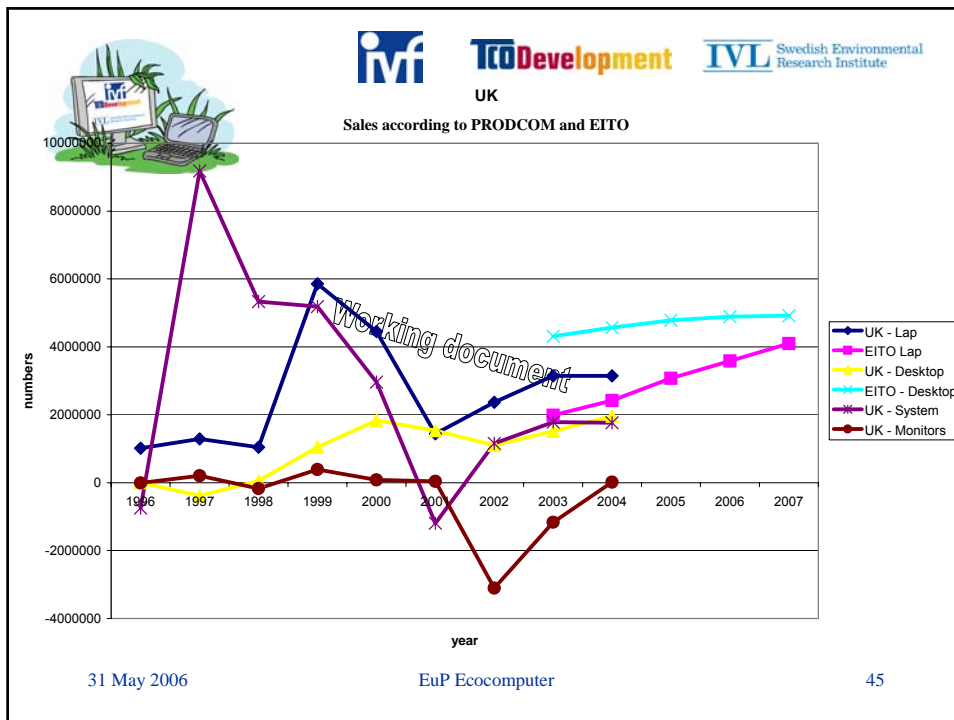


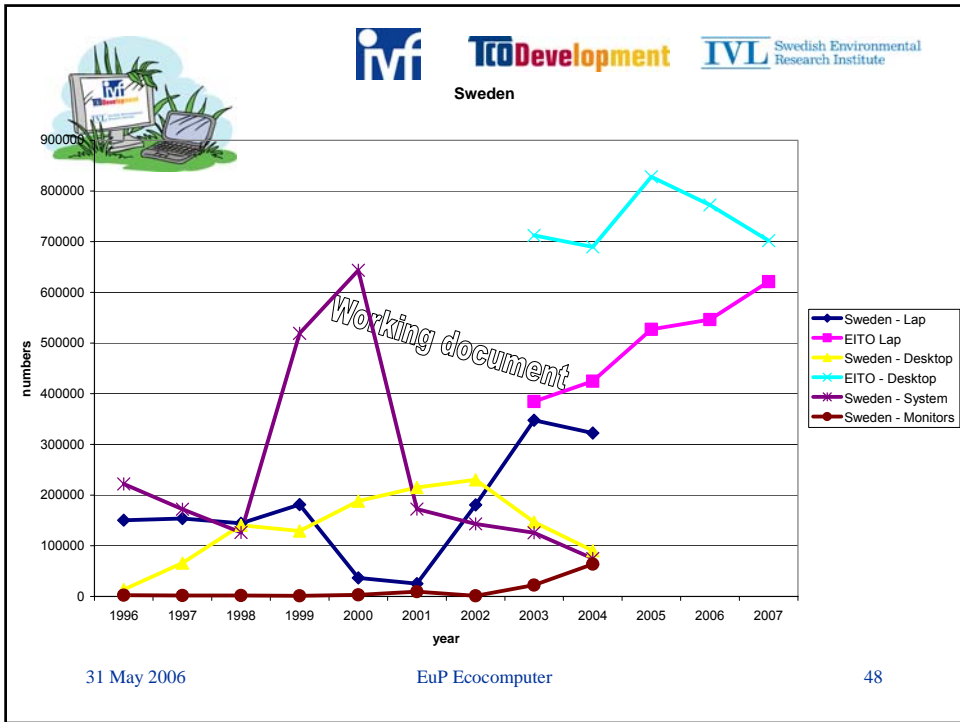
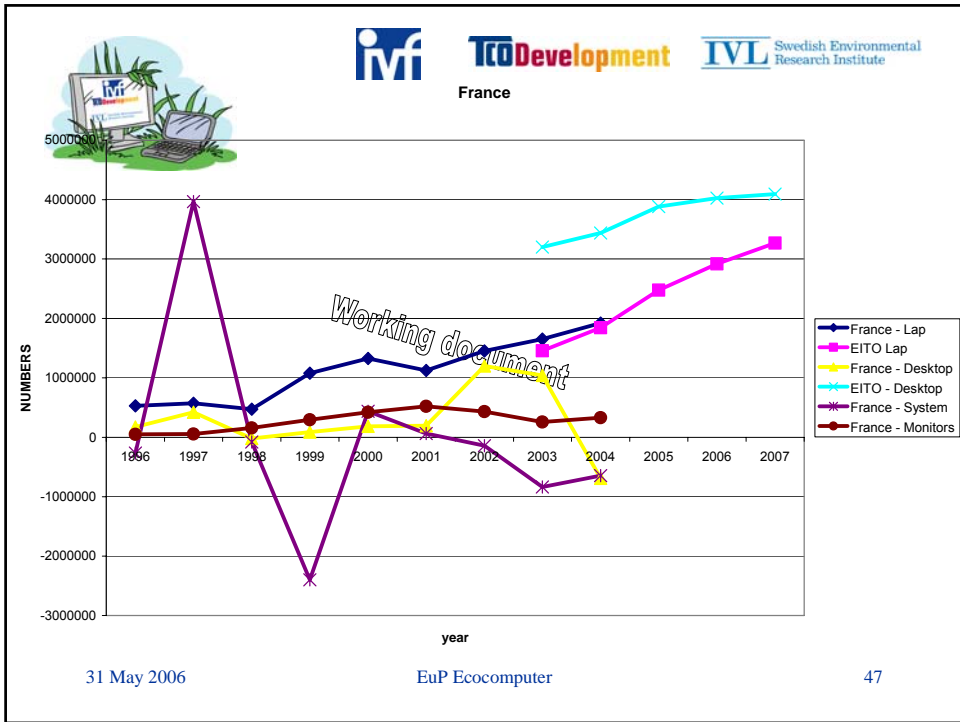
X=?  
Y=?

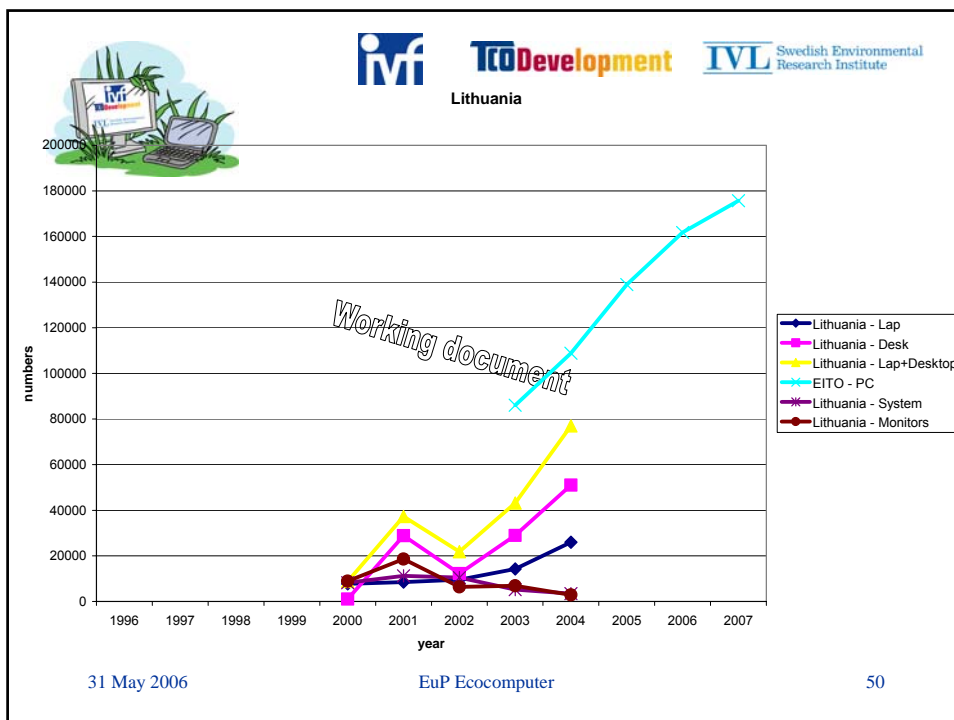
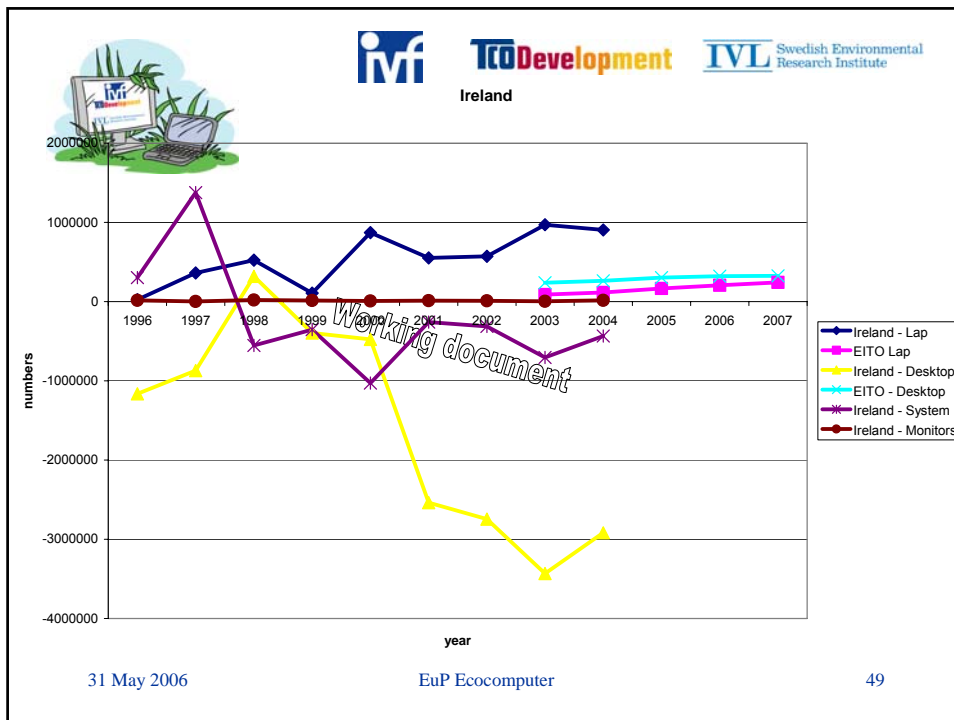
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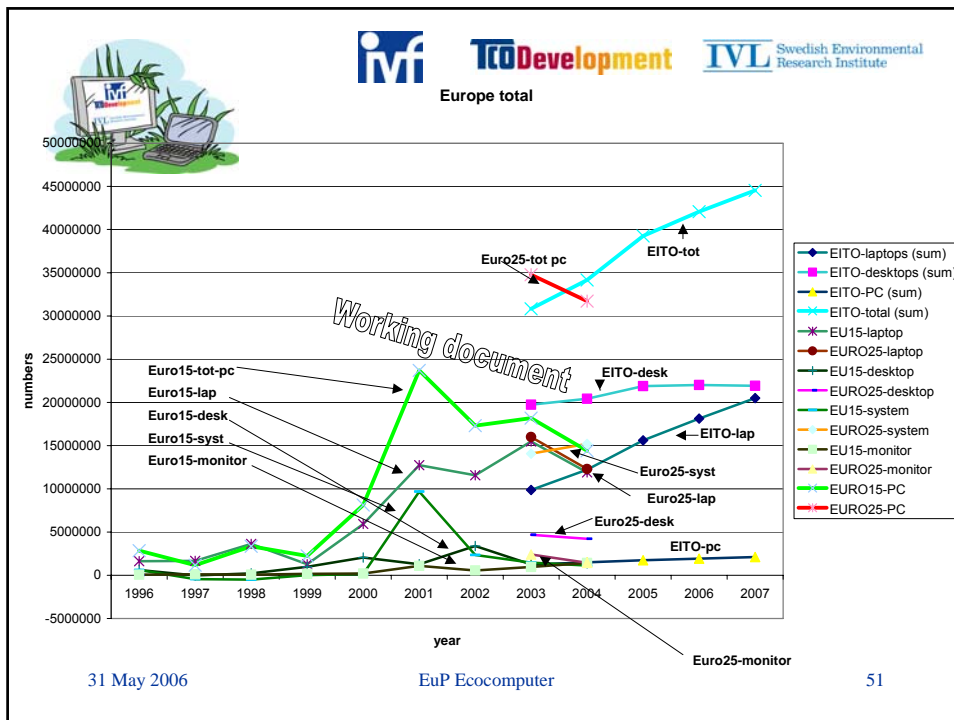
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**How to cooperate!?**

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## Now

- We are now in the beginning of our work, please let us know if there are things which should be changed to get an even better study.
- Register on the website if you would like to get news from the project.
- Further cooperation

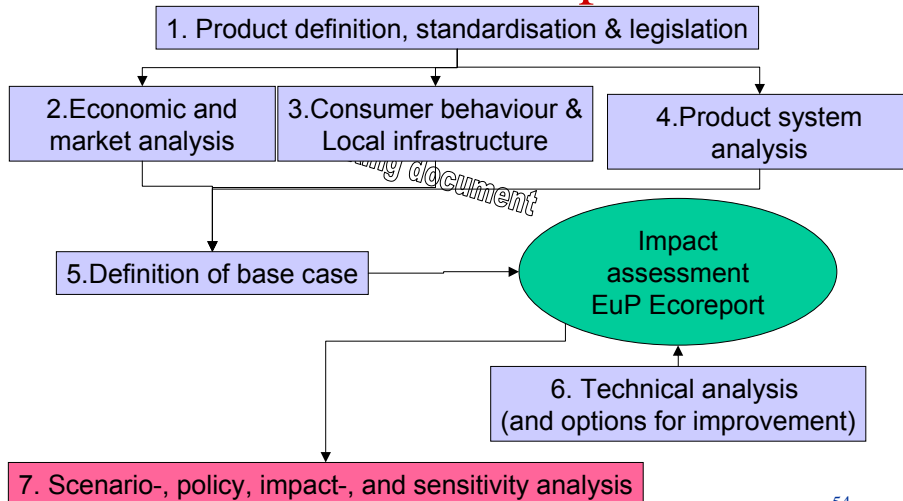
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## How to cooperate!?



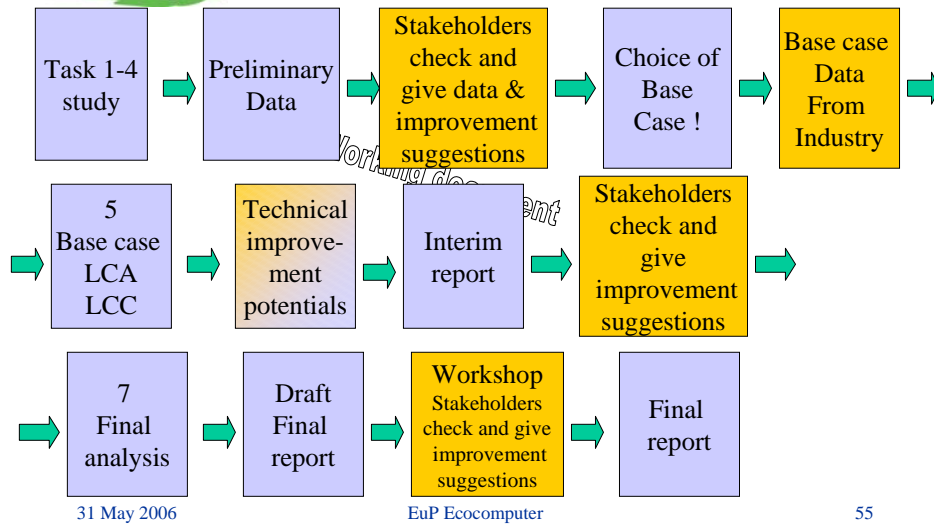
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## Next step preliminary



## Possible methods for cooperation

- Questionnaires to all manufacturers
- Working groups
- Specific discussions and interviews with one at the time
  - Secrecy agreement?
  - Meetings
  - E-mail
  - Phone
- ...?



## Special issues for cooperation

- Consumer behaviour (tests)
- Functional unit
- Market Trends
  - Hardware
  - Software
- New technologies and the cost for them
- What is a "Standard computer" 2005?



## Special issues for cooperation Continued

- Base case information.
  - Bill of Materials (BOM)
  - Scrap etc
  - Purchase price in different countries
  - Life length
    - Laptop
    - Desktop
    - Monitor
  - EoL (past WEEE)
  - ...



## Special issues for cooperation Continued

- Better statistics if available

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## Discussions

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## Product definition

- Definition used in the statistics (Prodcom)
  - 30021200 Laptop PCs and palm-top organisers
  - 30021300 Desk top PCs
  - 30021400 Digital data processing machines: presented in the form of systems
  - 32302083 Black and white or other monochrome video monitors
  - 32302045 Colour video monitors with cathode-ray tube
  - 32302049 Flat panel video monitor, LCD or plasma, etc., without tuner (colour video monitors) (excl. with cathode-ray tube)



## Functional Unit

- Ask: What is the function the product shall fulfil?
  - Pen:  
Write 10m lines over five years
  - Car:  
Transport 4 persons 200 000 km over 10 years
  - Radio base station:  
Transmit and receive communication to and from mobile phones at a certain traffic load, in a certain geographic area for 10 years



## Functional Unit?

- Computer
  - Computing service?
  - correlated to the amount of information, (bytes) ??
- Monitor
  - Size and quality of the screen,
  - Perhaps measured in mega pixels.



## Benchmarks used by others

Lars Johansson, IVF

- 3D Graphics
  - fps in different games such as F.E.A.R., Quake III, Quake 4 ...
- 3D Rendering
  - Time to render 3D graphic in for example Autodesk 3D Studio Max 8, 3dsmax 7
- Video encoding
  - Time to decode/encode movies, for example with CloneDVD, DivX 6.1, Mainconcept MPEG Encoder 1.5.1, Pinnacle Studio 10 Plus



## Benchmarks cont.

- Audio encoding
  - Time to compress CD:s with for example Lame MP3, OGG 1.1.2
- Hard disk transfer performance
  - Measure hard disk transfer performance with measurement applications such as HDD h2benchw, IOMeter, Futuremark PCMark05 HDD
- Synthetic benchmarks
  - Run benchmarking applications such as Futuremark 3Dmark05, Futuremark PC Mark 2002, Futuremark PCMark05 Pro, SiSoft Sandra



## Benchmarks cont.

- Office applications
  - Time to do specific tasks, for example macros in Word, compress with WinRAR or run benchmarking applications such as Futuremark Sysmark, WinStones 2004, WorldBench 5
- Battery capacity
  - Measure how long the battery lasts when running specific tasks using benchmark applications such as BAPCo MobileMark



## Functional unit used

- Product types
  - Energy Star
    - Workstation, Desktop A/B, Integrated Computer A/B, Desktop Server, Game Console, Notebook
  - TopRunner
    - Server-side, Client-side non-battery, Client-side battery and sub groups on amount of memory and signal channels
- Performance
- "Average" computer
  - € 1000 or \$ 1000 computer
- ???

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## Discussion about Trends and technologies

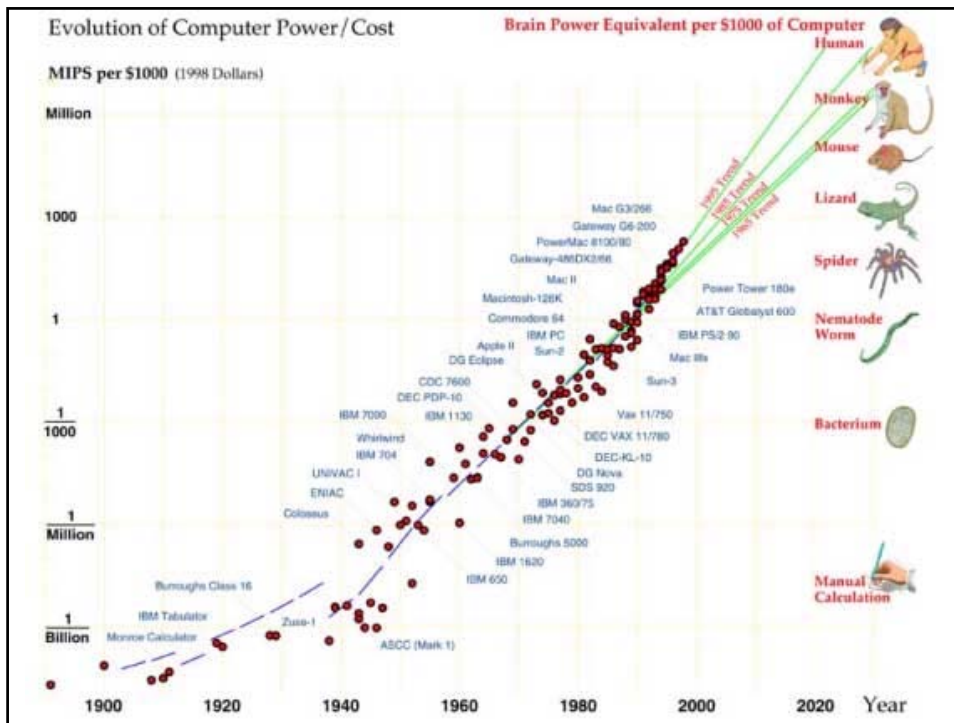
Per Kilbo, IVF

Hans Grönqvist, IVF

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## Suggestion

- We send out a questionnaire to you
  - Base case information for the different product groups
    - Best seller for the different types
  - Consumer behaviour for different products
  - Functional unit thoughts
  - Market shares for the different types
  - Economic and market data
  - Technological and market trends

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## Thank you for your interest!

- Please let us know if there are other organisations which we should contact!
- Keep yourself informed!
  - Register at our website, and you will get information when we publish things at the website! **www.ecocomputer.org**
- Thank you for giving help and data! We will come back to you with questions!

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