Midterm Meeting

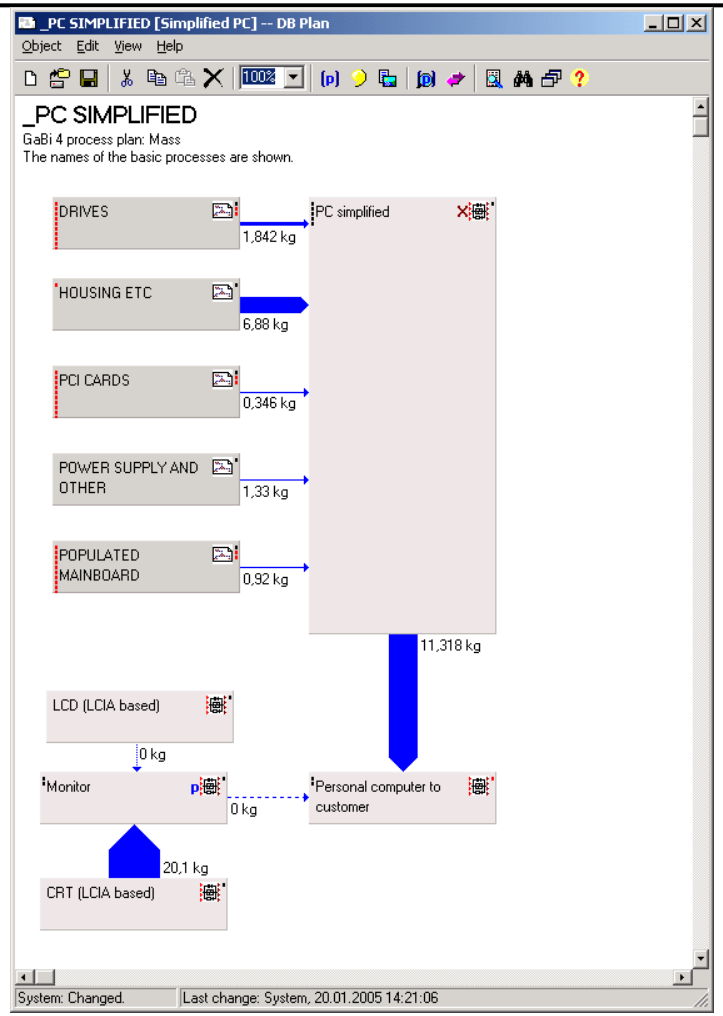
(Work package 1)

Brussels

05 July 2005

IKP, University of Stuttgart

Work package 1
LCA of a PC



Work package 1

Life Cycle Inventory (LCI) table – Information base for indication

Inputs — Diagram

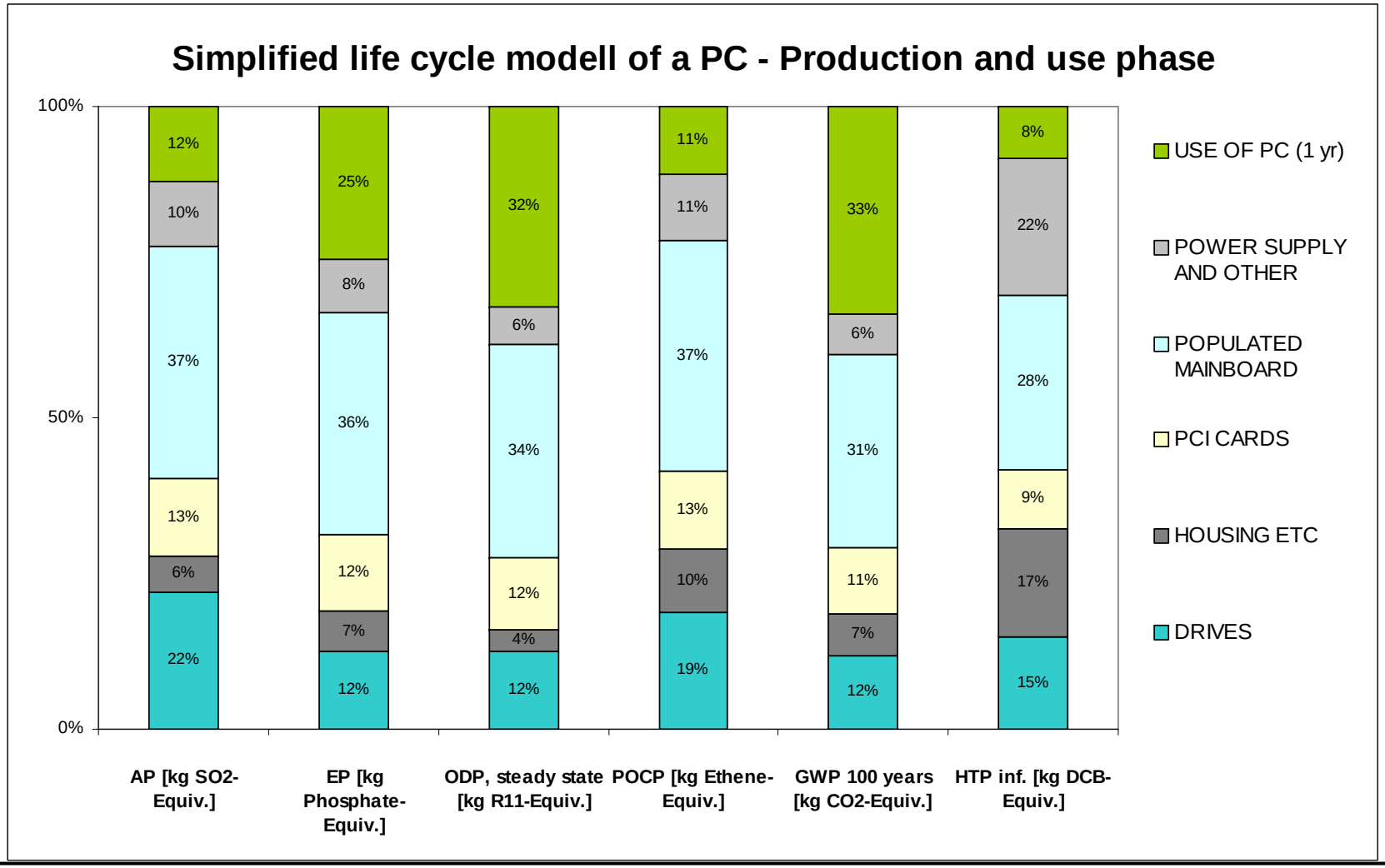
	_PC SIMPLIFIED	DRIVES	HOUSING E	PCI CARDS	POPULATED
Non renewable elements	**1,0496E-5**	**2,5919E-6**	**5,6189E-7**	**1,6365E-6**	**4,8131E-6**
Non renewable resources	**629,05**	**210,34**	**67,604**	**72,302**	**212,65**
Bauxite	1,031	0,00064277		0,00033737	0,00099228
Bentonite	0,0056138	0,0013235	0,00069469	0,00076663	0,0022548
Calcium chloride	6,9635E-9	1,7533E-10		2,5918E-10	7,623E-10
Colemanite ore	0,12291	0,017027		0,02517	0,074031
Copper ore (0.14%)	247,62	122,94	24,634	17,441	51,296
Copper ore (0.3%)	6,7782E-7	8,0259E-8		1,1864E-7	3,4895E-7
Dolomite	0,0034677	0,00031544	0,0028787	1,3851E-6	4,0739E-6
Fluorspar (calcium fluoride; fluorite)	0,0077519	6,3251E-6		3,3199E-6	9,7644E-6
Heavy spar (barytes)	0,089015	0,020902	0,011198	0,012158	0,035758

Outputs — Diagram

	_PC SIMPLIFIED	DRIVES	HOUSING E	PCI CARDS	POPULATED
Emissions to air	**1091,4**	**200,74**	**55,816**	**186,54**	**548,63**
Heavy metals to air	**0,0011311**	**0,00043576**	**0,0001007**	**0,00011001**	**0,00032355**
Inorganic emissions to air	**486,25**	**93,212**	**24,939**	**82,404**	**242,36**
Ammonia	0,00039496	8,8629E-5	4,6091E-5	5,7249E-5	0,00016838
Ammonium	8,3237E-6	3,3138E-7		4,8987E-7	1,4408E-6
Ammonium nitrate	3,1053E-8	7,6684E-9	1,6624E-9	4,8416E-9	1,424E-8
Barium	0,00010696	2,0997E-5	7,5184E-6	1,73E-5	5,0882E-5
Beryllium	3,7185E-7	5,793E-8	7,2623E-9	6,9621E-8	2,0477E-7
Boron compounds (unspecified)	0,00031409	6,0128E-5	1,1244E-5	5,4173E-5	0,00015933
Bromine	8,9994E-5	1,6536E-5	2,5538E-6	1,6013E-5	4,7098E-5
Carbon dioxide	141,86	25,322	13,97	22,62	66,53
Carbon monoxide	0,16875	0,018586	0,10029	0,0077545	0,022807
Chloride (unspecified)	0,00013859	2,3552E-9	0,00013796	3,4816E-9	1,024E-8
Chlorine	2,1289E-6	1,1333E-7	2,1836E-8	1,6428E-7	4,8318E-7
Fluoride (unspecified)	4,3115E-5	8,2293E-6	1,1765E-6	7,6347E-6	2,2455E-5
Fluorides	2,6543E-8	2,7969E-9		4,1345E-9	1,216E-8
Fluorine	7,8978E-7	3,1742E-8	2,2395E-8	3,6812E-8	1,0827E-7
Helium	0,00019576	2,5455E-5	2,5523E-5	3,1986E-5	9,4076E-5

Work package 1

LCA results (monitor not regarded, 1 year use)



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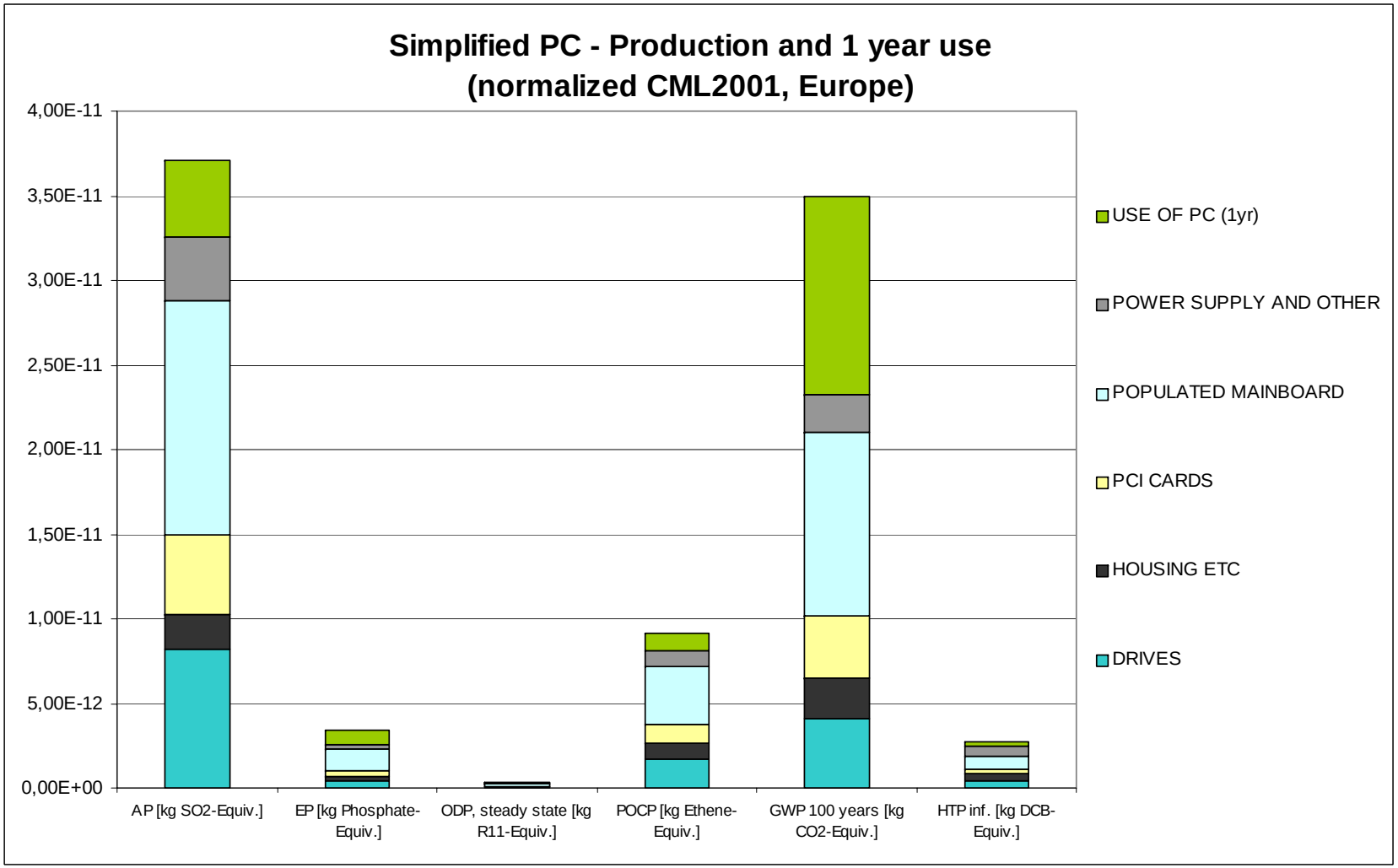
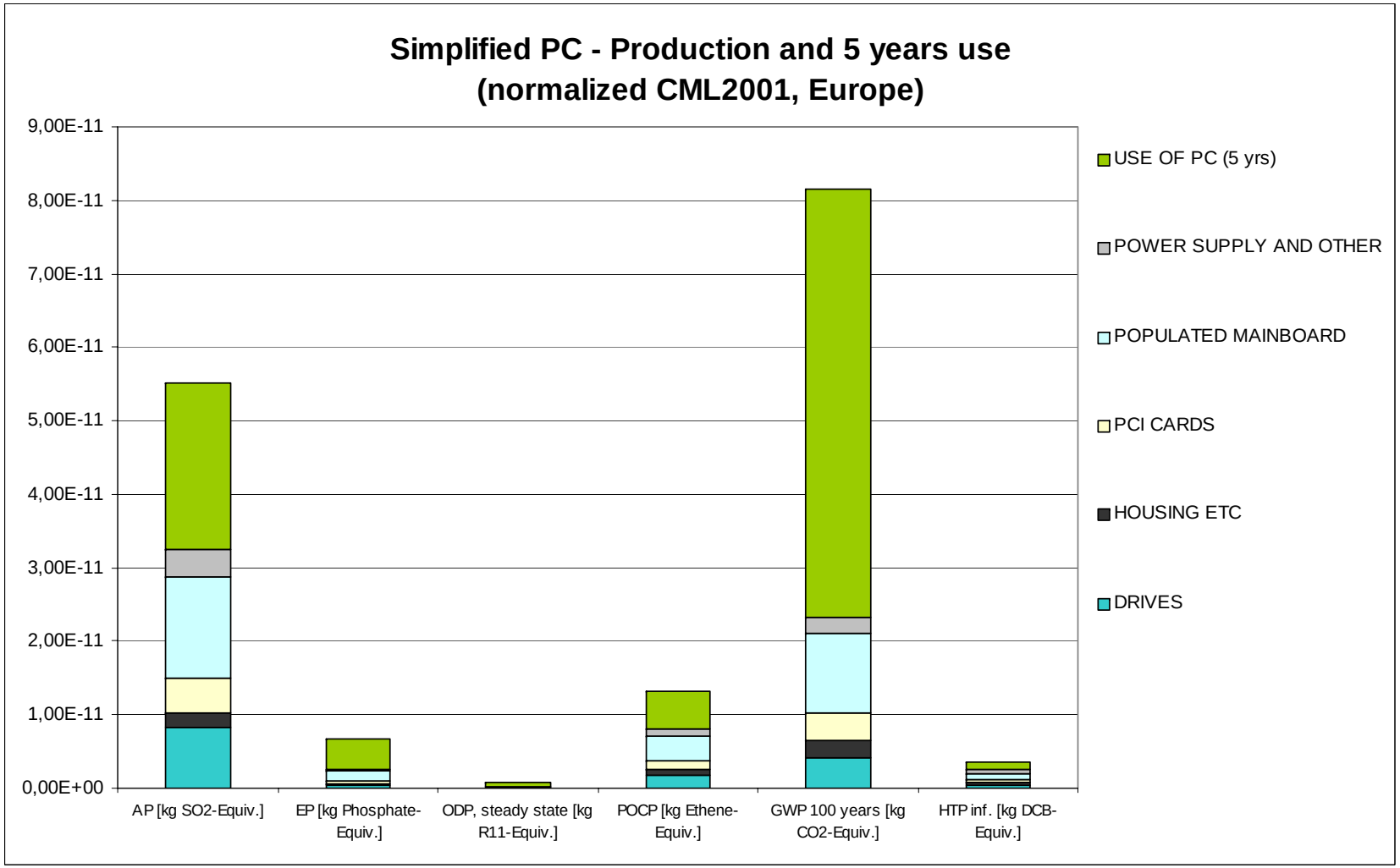
LCA results (monitor not regarded), normalized (1 year use)



Work package 1

LCA results (monitor not regarded) normalized (5 years use)



Work package 1

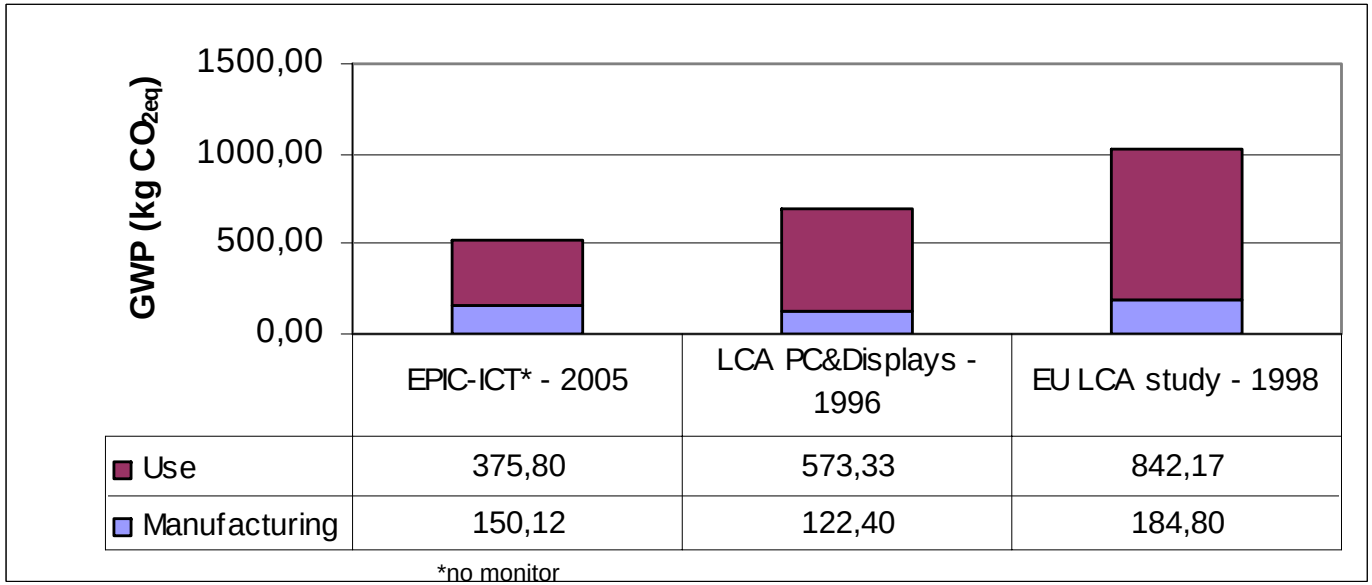
Comparison of LCA results with other studies I

	LCA PC&Displays	LCA EU Ecolabel	LCA&Peripheral equipment	LCA on PCs	EPD Fujitsu	LCA of a PC and its effective recycling rate
GWP ($kgCO_{2eq}$)	√	√		No absolute values	√	√
AP ($kgSO_{2eq}$)	calculated from LCI according to CML2001	√		No absolute values	√	√
POCP (kgC_2H_{4eq})	calculated from LCI according to CML2001	√		No absolute values	√	√
Energy consumption (MJ)		√	√	No absolute values	√	

Work package 1

Comparison of LCA results with other studies II

Operating time: 10400 hours



	EPIC-ICT* DESKTOP PC	LCA PC&Displays DESKTOP PC	EU LCA study DESKTOP PC
GWP (kg CO_{2eq})	**525,92**	**695,73**	**1026,97**
AP (kg SO_{2eq})	**2,07**	**n.a.**	**9,19**
POCP (kg C_2H_{4eq})	**0,14**	**n.a.**	**0,27**
Energy consumption (MJ)	**9437,10**	**n.a.**	**22848,32**

***simplified model - no monitor**

- Indicators used in literature are consistent with the screening model (GWP, AP, POCP, Primary Energy)
  - Toxicity aspects to be evaluated
- Operating time and energy consumption rates crucial factors
- Results are comparable if use phase is normalised to the same number of operating hours

Work package 1
LCA – Summary status

- Study on simplified PC was carried out
- Data lacks are identified
- Data comparison of leading electronic LCA databases (Philips, Motorola, IKP/PE) is ongoing
- Comparison with other published studies is carried out
  - differences are analyzed and evaluated
- Technical based LCA model enables reliable and applicable Ecodesign approach

The LCA results in EPIC-ICT will be used for

- Identification of main environmental drivers for product groups
- Generation of “Generic Modules” (DfE, Ecodesign)
- Definition of requirements for data and models to be used for indicator calculation