

Laboratory of
ecosystem management

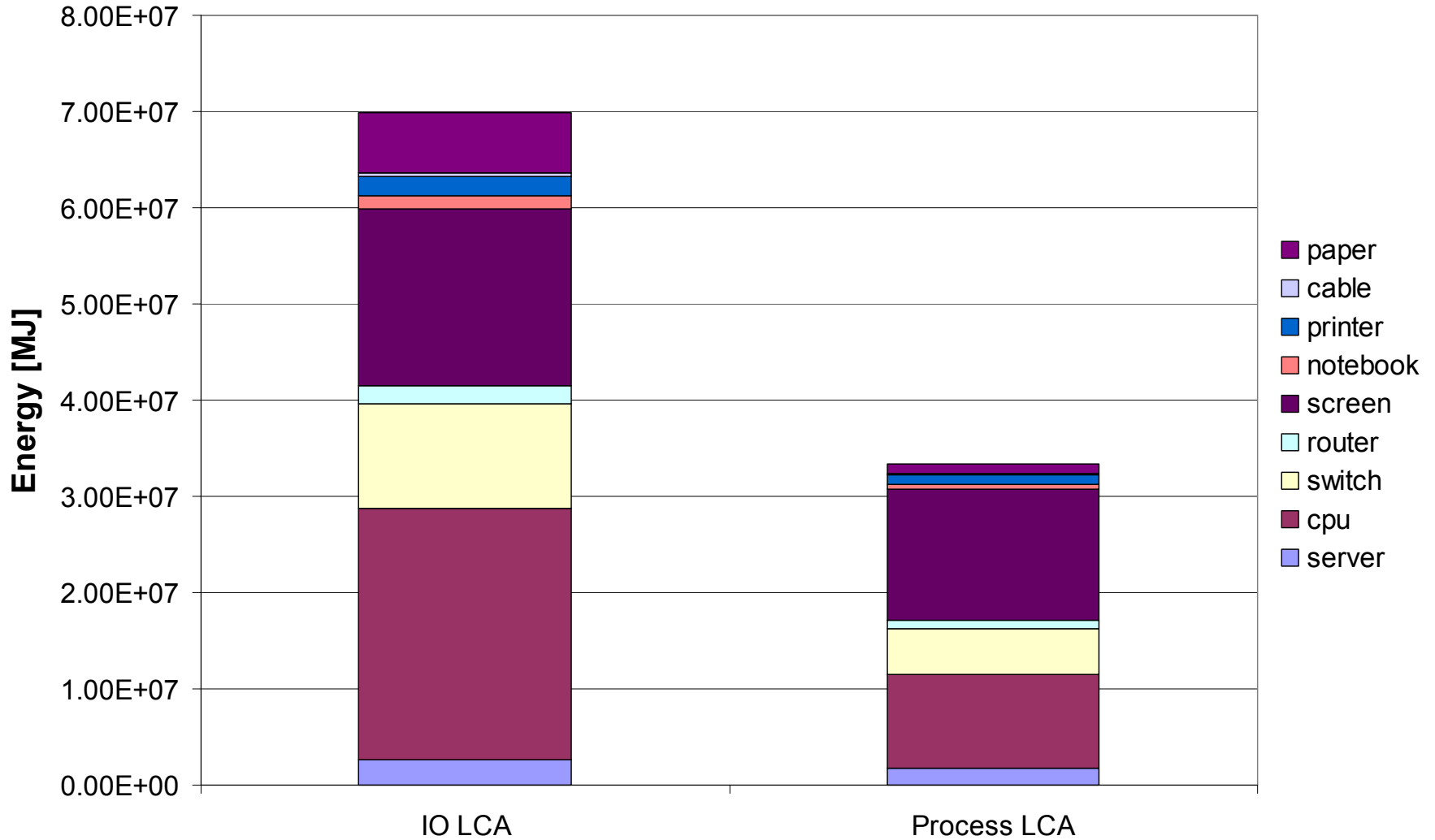
Comparison of the Impacts of the EPFL Computer Network using Process and Input- Output LCA

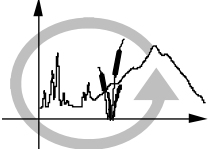
Yves Loerincik, Olivier Jolliet, Greg Norris

Inventory of necessary equipment for the computer network infrastructure at the EPFL

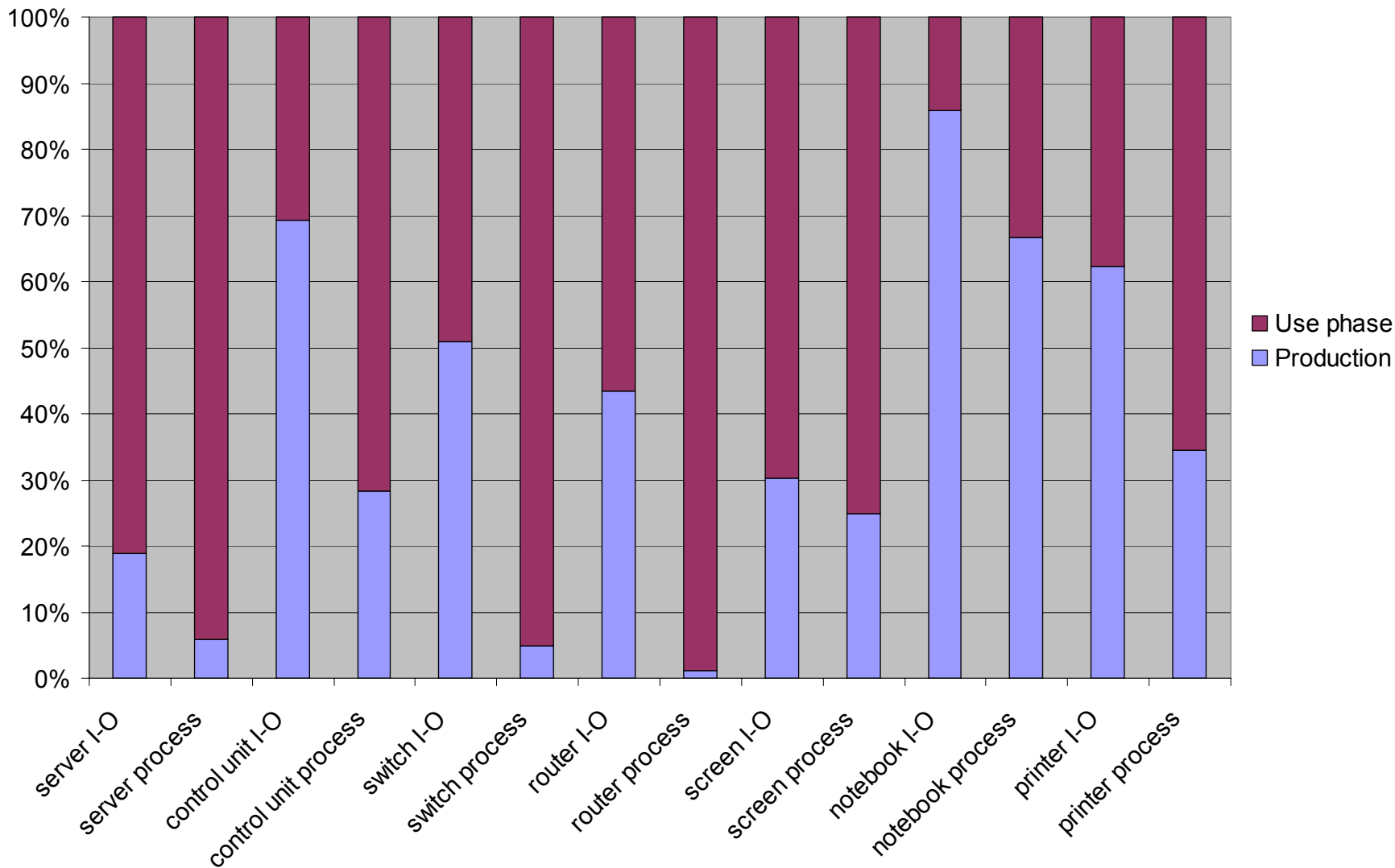
| Equipment | Number |
|-----------|--------------|
| server | 68 |
| switches | 90 |
| router | 22 |
| PC | 6745 |
| notebook | 355 |
| printer | 400 |
| cable | 121225 meter |

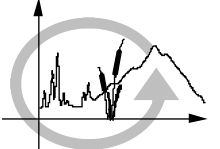
Results for the embodied primary energy



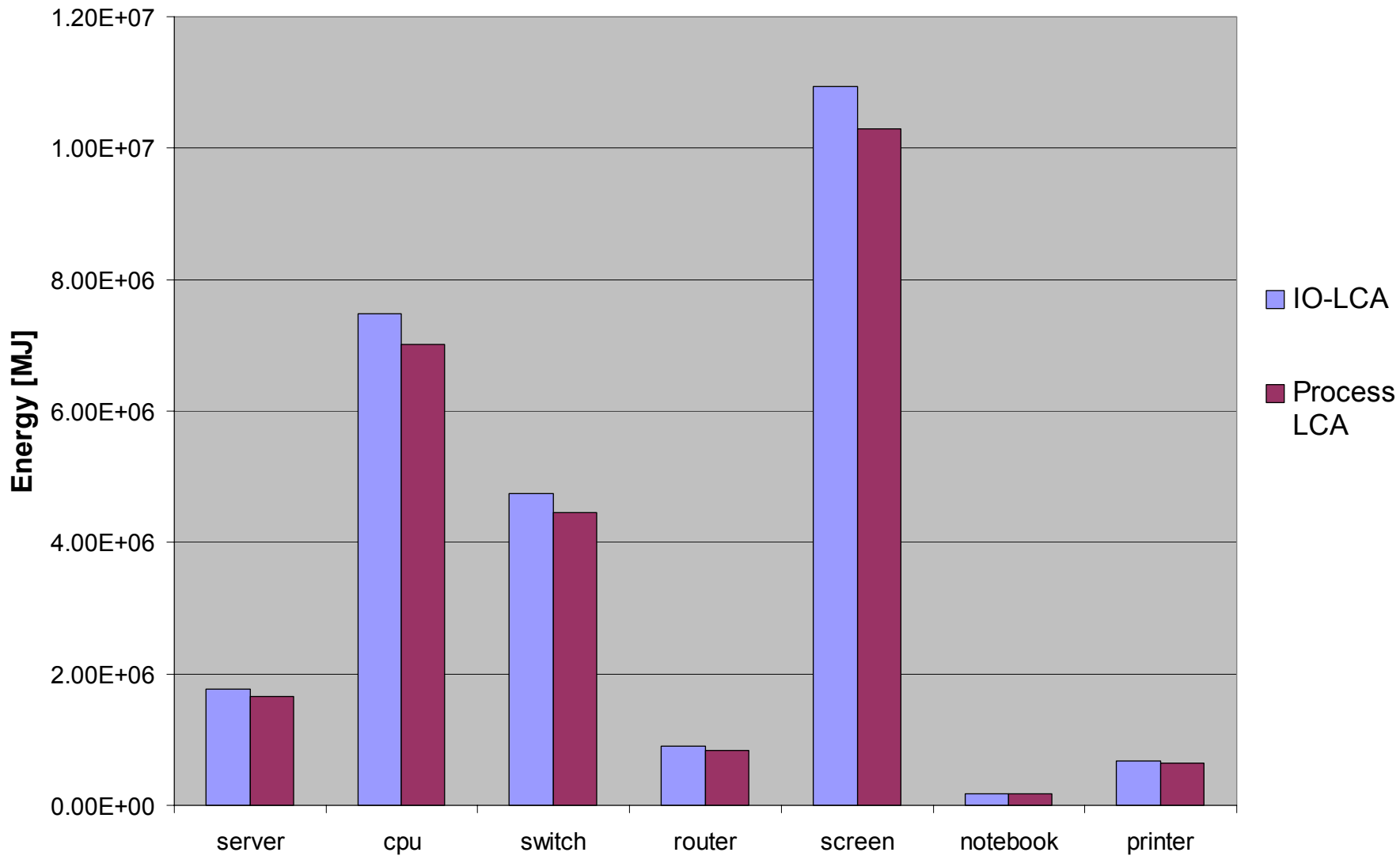


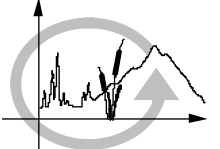
Embodied primary energy for the use and the production phase



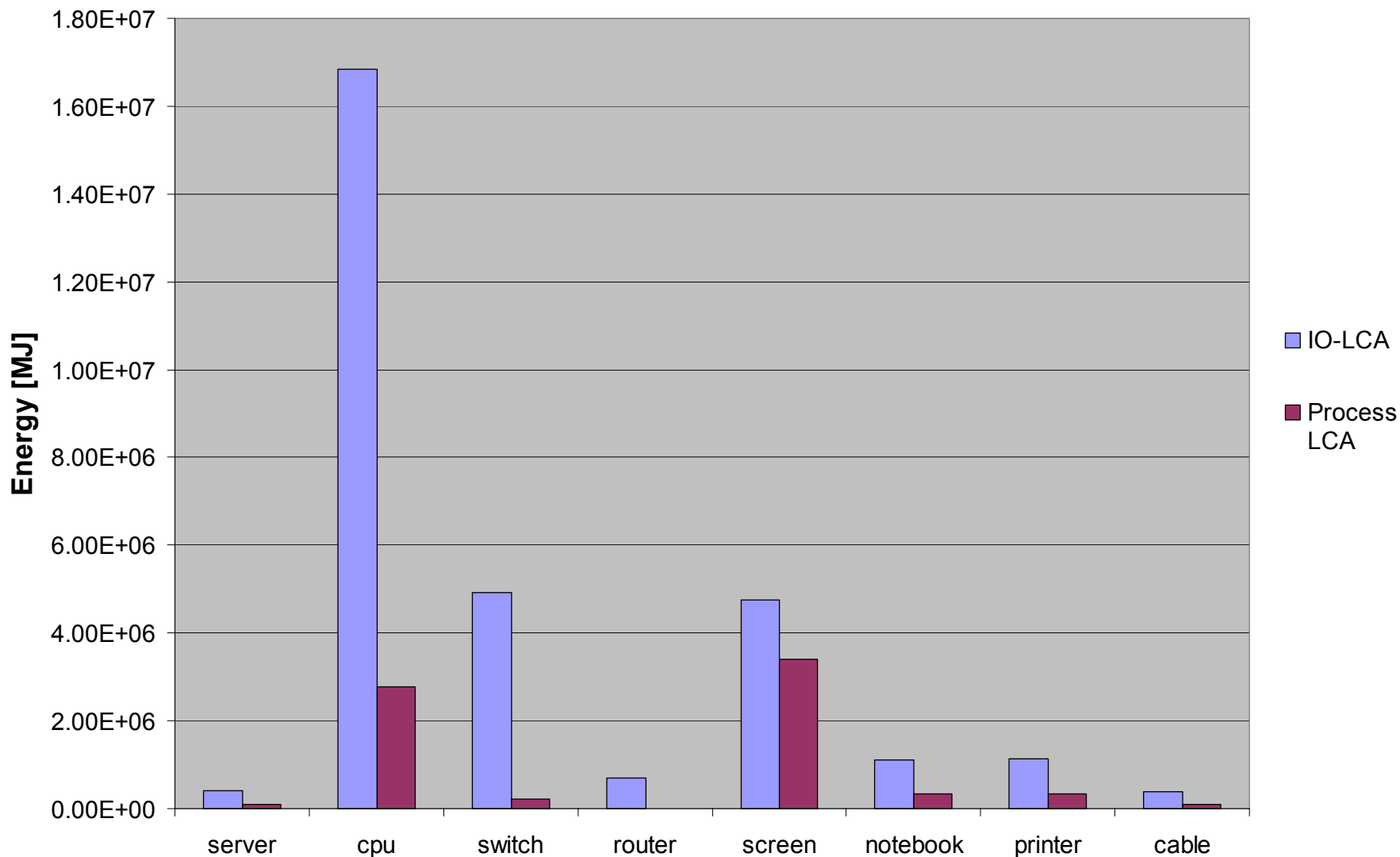


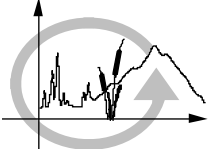
Comparison use phase primary energy





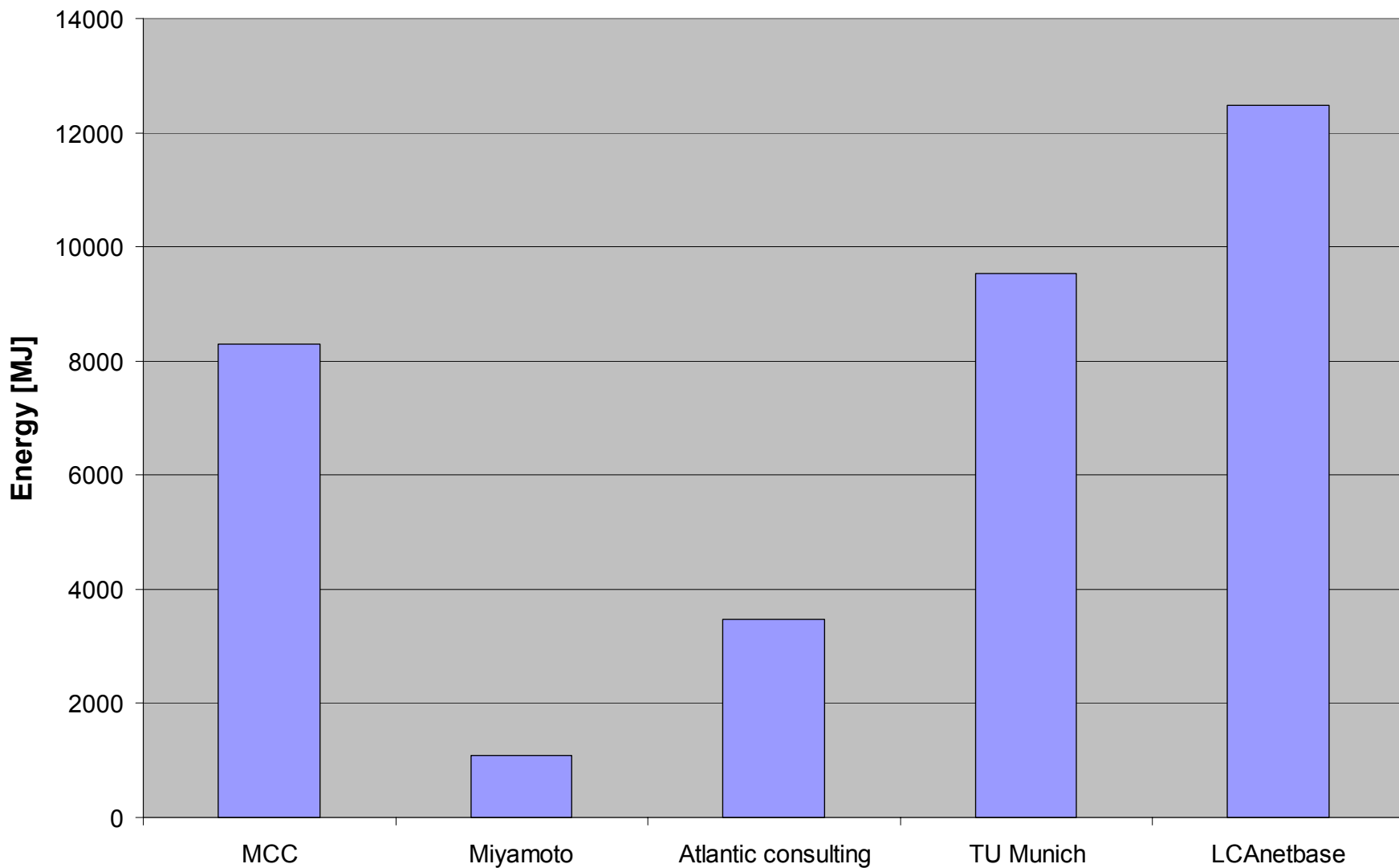
Comparison production embodied primary energy

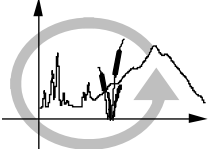




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Embodied primary energy for the PC production, different LCA studies



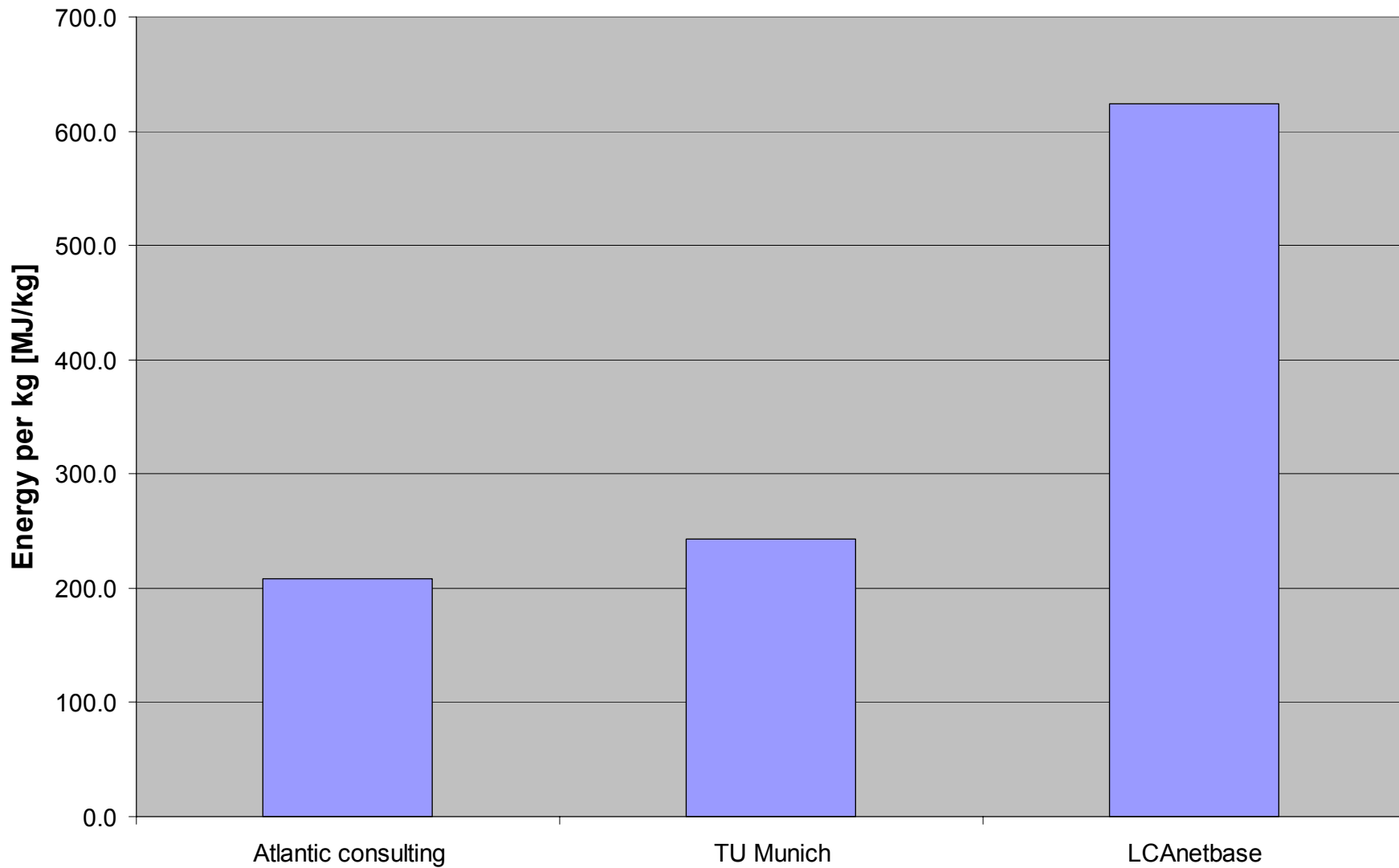


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Embodied primary energy per kg of PC for the PC production



levels of comprehensiveness

| | % to total upstream embodied energy | cumulative % |
|---|--|--------------|
| Air transportation | 12% | 12% |
| Electric services (utilities) | 12% | 24% |
| Computer peripheral equipment | 10% | 34% |
| Wholesale trade | 10% | 43% |
| Semiconductors and related devices | 9% | 53% |
| Petroleum refining | 6% | 59% |
| Other electronic components | 5% | 64% |
| Miscellaneous plastics products, n.e.c. | 4% | 68% |
| Relays and industrial controls | 3% | 71% |
| Gas production and distribution (utilities) | 3% | 74% |
| Automotive rental and leasing, without drivers | 2% | 76% |
| Hotels and lodging places | 2% | 78% |
| Telephone and telegraph apparatus | 2% | 80% |
| Aluminum rolling and drawing | 2% | 81% |
| Motors and generators | 1% | 83% |
| Blast furnaces and steel mills | 1% | 84% |
| Sheet metal work | 1% | 85% |
| Electron tubes | 1% | 85% |
| Nonferrous wiredrawing and insulating | 1% | 86% |
| Fabricated metal products, n.e.c. | 1% | 87% |
| Legal services | 1% | 87% |
| Paperboard containers and boxes | 1% | 88% |
| Motor freight transportation and warehousing | 1% | 89% |
| Power, distribution, and specialty transformers | 1% | 89% |
| Gaskets, packing, and sealing devices | 1% | 90% |
| Metal stampings, n.e.c. | 1% | 91% |
| Real estate agents, managers, operators, and lessors | 1% | 91% |
| Banking | 1% | 92% |
| Eating and drinking places | 1% | 92% |
| Management and consulting services, testing and research labs | 1% | 93% |



Next

1. Look at all the expenses related to the computer network (maintenance, software, buildings, security equipment etc...) and evaluate their impacts.
2. Use an hybrid approach to assess in more details the important contributions (PC, electricity, ?,...).