GREEN IT
entre
l'université et l'industrie

Christina Herzog, Laurent Lefèvre, Jean-Marc Pierson

herzog@irit.fr, laurent.lefevre@inria.fr, pierson@irit.fr

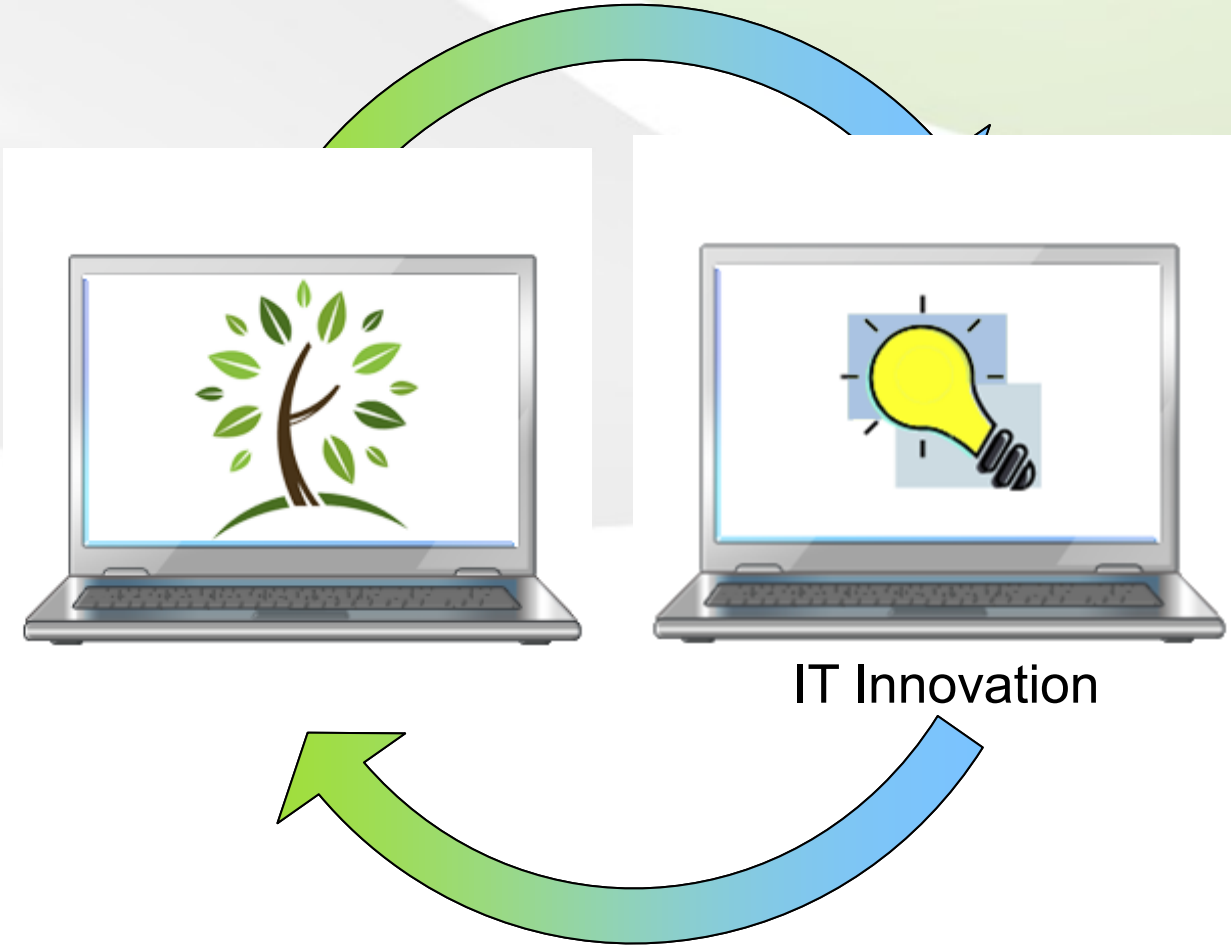
IRIT
CNRS - INPT - UPS - UT1 - UTM

Université de Toulouse

Inria
INVENTEURS DU MONDE NUMÉRIQUE

ENS DE LYON

Virtuous circle in IT innovation



Green IT

- IT emits 600 Mtons of CO_2, growing 60% in 2020
- Estimated to 10% of global consumption of electricity (90 TW)
- Data Centers themselves account for 2% of the global electrical consumption
- Carbon footprint equivalent to aeronautics (as of 2007)

But actually what is Green IT : How to define it?

- Different definition, difficult to include all parameters: from electricity to environment
  - PC or Server rooms, subsystems (processors, cooling)
  - Soft- and Hard-ware problem
  - Life cycle (production, transport, usage, e-waste)
  - Environment (carbon emission, …) and resources (raw material, water usage, …)

Reasons for such difficulty to have a definitive definition of Green IT:

- young research field (20/30/40/50 years ago who cared?)

- interests of users and companies **fluctuating** rapidly and so are incentives (ex: costs, taxes, …)

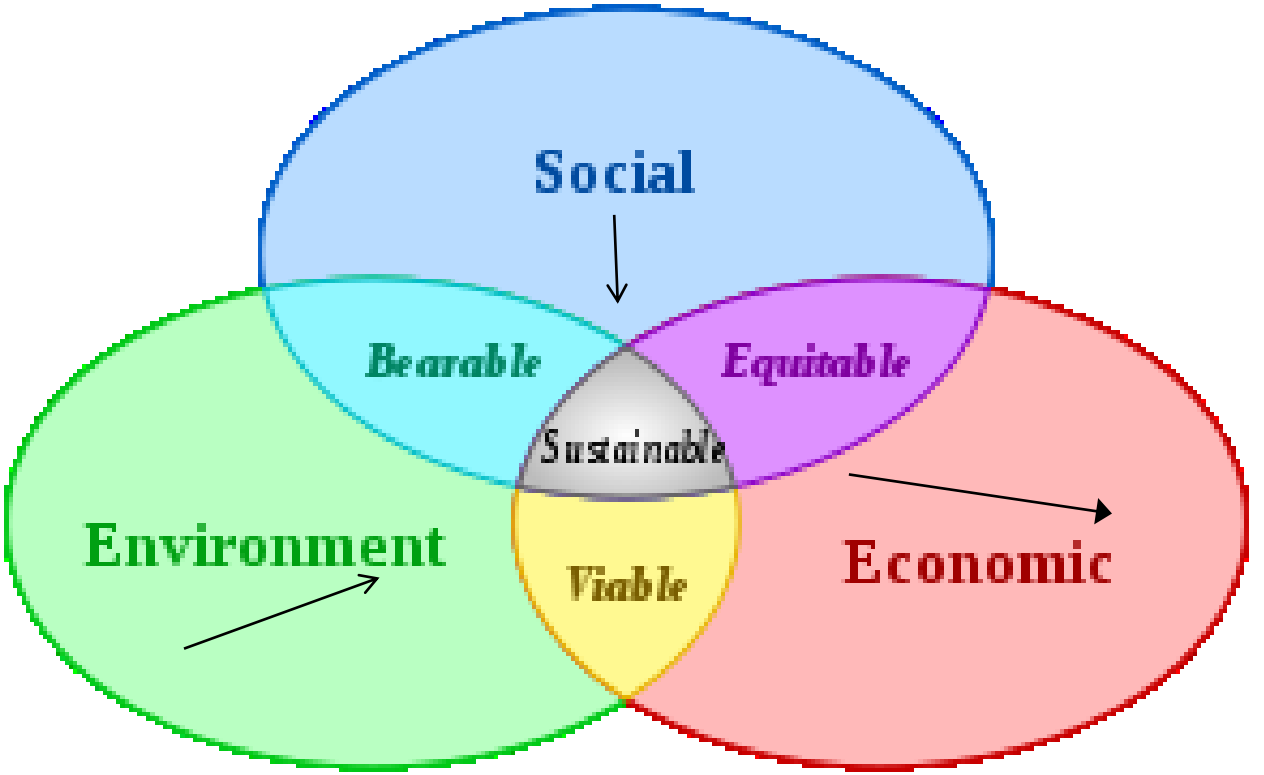
Motivations for Green IT

- Ecological
  - Awareness of the full Life Cycle: Production in China equals usage for 6 years in Switzerland in terms of CO2 emissions
  - Awareness of the different production means (hydro, nuclear, coal, gas, …). IEA.
- Social
  - Incentives from government agencies (legal enforcement and tax advantages). Ex: Germany
  - Marketing and Hype for Green in companies

- Economical
  - Price of electricity is raising: use more renewable or limit usage

Definition of Green IT

- Green IT : Tendency to the movement (effort) towards sustainability



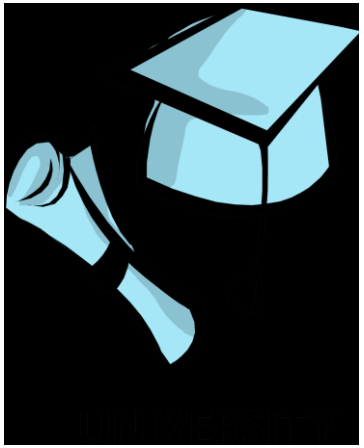
Example: a company chooses new server room

Industry vs or with academia

academia **industry**

Duties, Core Competences, Approach, Priorities of Topics, Selection of Topics, Criteria of Efficiency, Criteria of Quality of Work, Reference Groups, Distribution of Results, Freedom of Action, Funding, Organisational Framework, Relation With Other Units of the Organisation

Research and Innovation Process
Criteria and Dissemination
Organisation



Examples:

- Approach:

Search and find: e.g: measuring load of servers, changing cooling, to develop new DCIM (Data Center Infrastructure Management) software

Decide and act: e.g.: buy DCIM software ready to use

- Criteria of Efficiency:

Scientific reputation: e.g: Plenty of un-investigated problems, BUT not « old wines in new bottles »

Profit and company value: e.g: ROI(return of investment), Green hype, Green washing

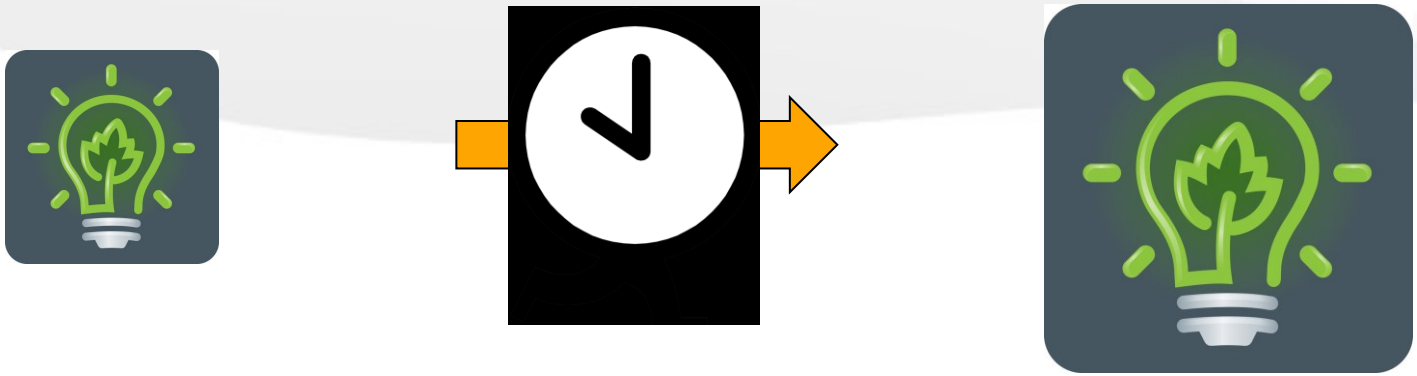
- Freedom of Action:

High but limits through resources: e.g: GreenIT allows breakthrough research, many open public calls where Green IT is present

Limits through management: Some innovations might be too ambitious with only long term ROI

Ideas……

- Green IT is a young research field : it is still possible to build up good databases on ongoing research and to follow innovations as the community is still manageable

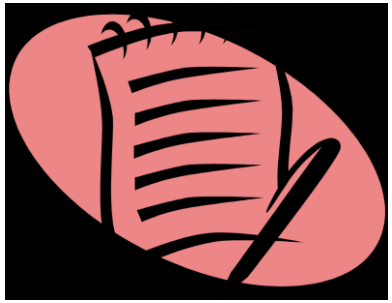


…. ideas

- **GreenIT** can be enhanced by finding and providing **solutions** from/for other fields or companies **through cooperation**, e.g: software can be developed to operate an energy efficient datacenter building, integrating DCIM and BMS (Building Management System)

…. ideas

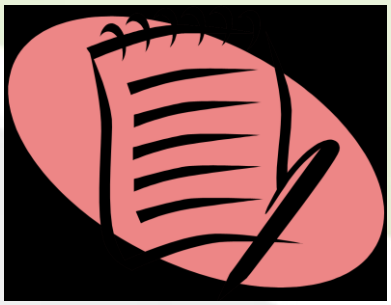
- **TTOs** (Transfer Technology Offices) collect data: technical knowledge, funding possibilities and contact. Research centers integrating TTOs have these data prepared for both: constructing a dedicated cooperation answering the needs of companies or society ; **transferring directly GreenIT solutions** when these meet the needs of parties.

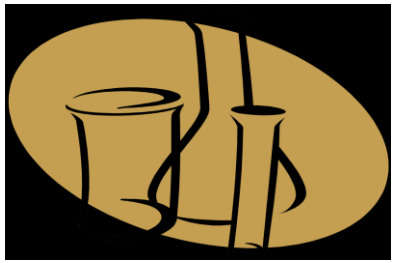


…. ideas

- **Companies** should use **TTOs** and **Angel investors** for financing projects and collaborations-with the help of funding organizations and without the delay caused waiting for open public calls.

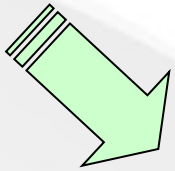
Future



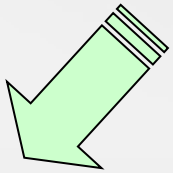


Future!

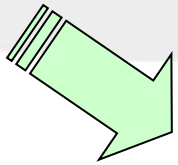
Pointing out different objectives, aims and approaches



Better understanding between partners (academia, industry, funding organisations)



Change in cooperation and knowledge transfer due to better understanding



Less knowledge and innovations losses in the fast changing field of Green IT

Bigger impact of Green IT on the society

First step: Filling out a table with data from a project to see if all information are available (we are partner is this project)

Project	Partners	Industry	TTO	Countries	Total Budget	Budget for Green
CoolEmAll	7	3	yes	5	2,645 000	?
PrimeEnergyIT	10	3	?	7	1,202 000	?

Second step: to see which information we can get from e.g.: Cordis for other projects

Project	Partners	Industry	TTO	Countries	Total Budget	Budget for Green
FIT4Green	10	3	?	5	?	?
GREEN FLEETS	8	2	?	7	276 973,-	?

To extract the global trends, e.g.:

Why are these countries, partners in more projects concerning Green IT?

Is the outcome/result/product of a project relevant for further collaborations? Spin-offs?

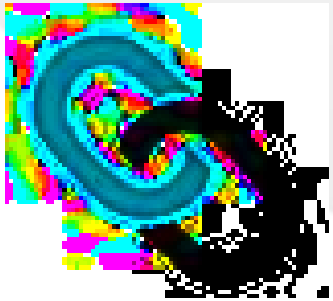
Are there TTOs involved? If yes, what is their importance-funding? IPR?

To verify if some predictions can be done!

……

Questions – Remarks

Thank you for your attention!



Let’s link!

Contact:
Herzog@irit.fr