Numérique Eco-Responsable

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Séminaire Humanités Numériques
8 Décembre 2023

About me

- **Now: PhD thesis at SEPIA team IRIT (Toulouse)**

  - Supervisors: Georges DA COSTA and Jean-Marc PIERSON
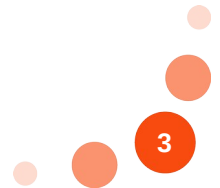
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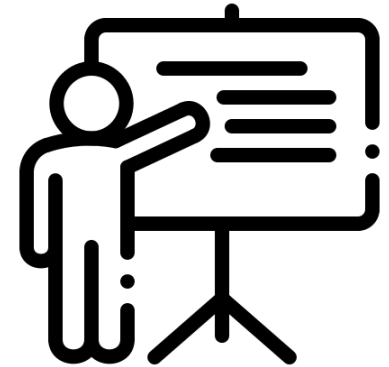
General introduction

Green IT & IT for Green

What happens behind a web page?

https://www.univ-tlse2.fr/

Calculé le 2023-12-07T14:39:41

Résultat pour www.univ-tlse2.fr

D

Hum, pas top.

Score : 47 / 100

Que veut dire mon score ⌄

La bonne nouvelle, c'est que vous pouvez faire beaucoup mieux !

max. 100   min. 0

A   B   C   D   E   F   G

Classement de la page :	99708 / 188685
▪ Trop lourde	3.163 Mo
▪ Trop complexe	763 éléments
▪ Trop de requêtes	47 requêtes

Two main paragims

Green IT

IT for Green

Framework to think about ICT & sustainability
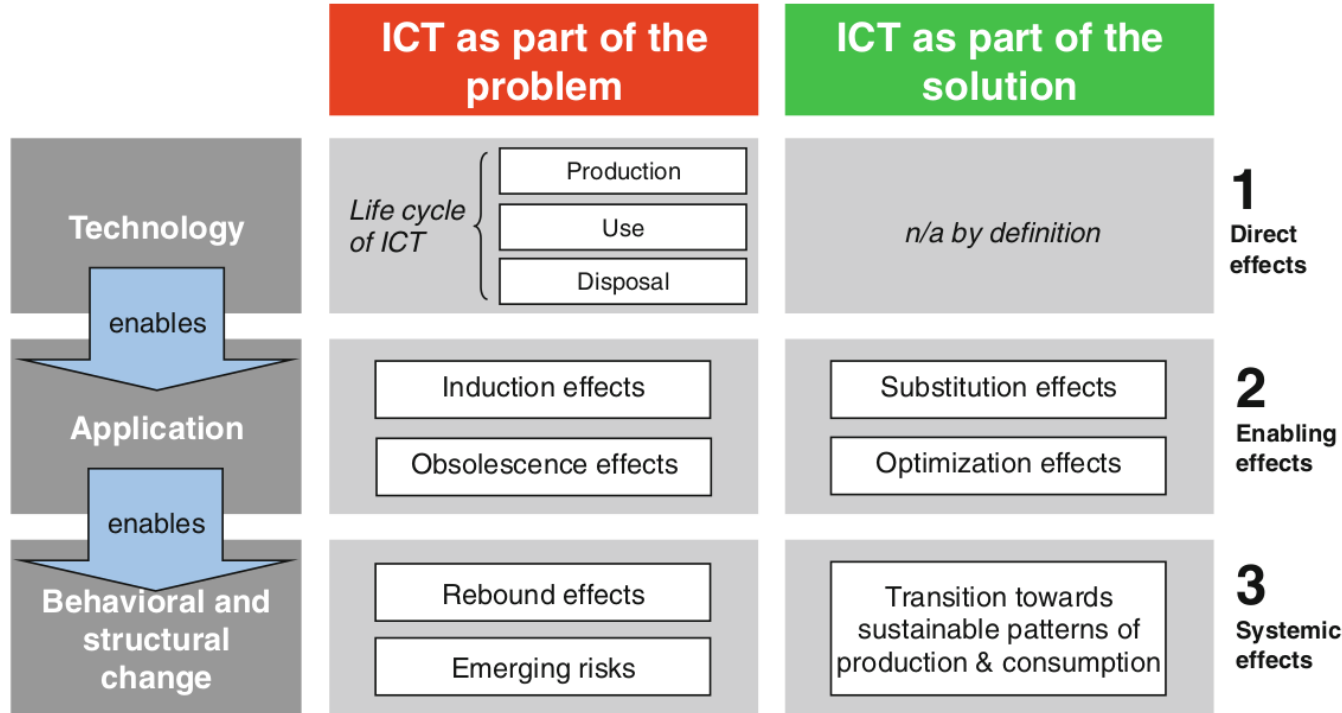
Hilty, L.M., Aebischer, B., 2015. *Ict for sustainability: An emerging research field*, in: ICT Innovations for Sustainability. Springer, pp. 3–36.

Framework to think about ICT & sustainability
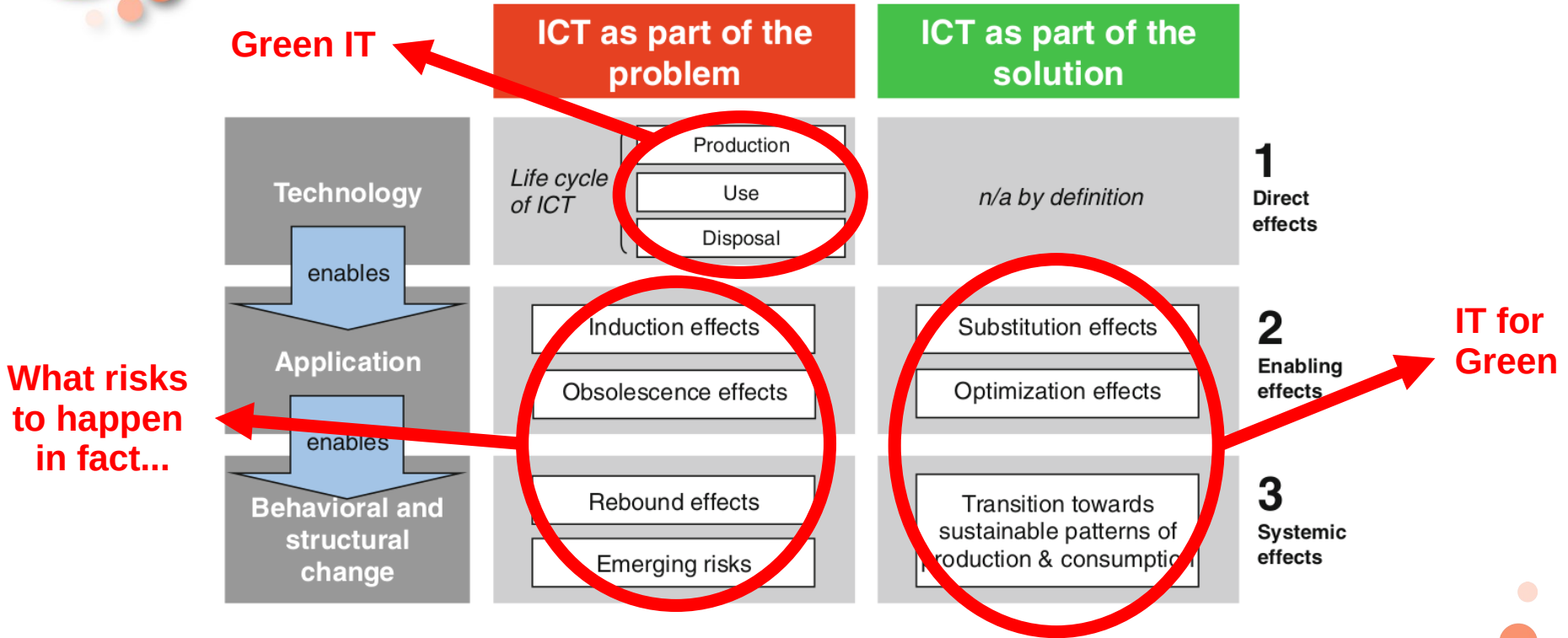
Hilty, L.M., Aebischer, B., 2015. *Ict for sustainability: An emerging research field*, in: ICT Innovations for Sustainability. Springer, pp. 3–36.
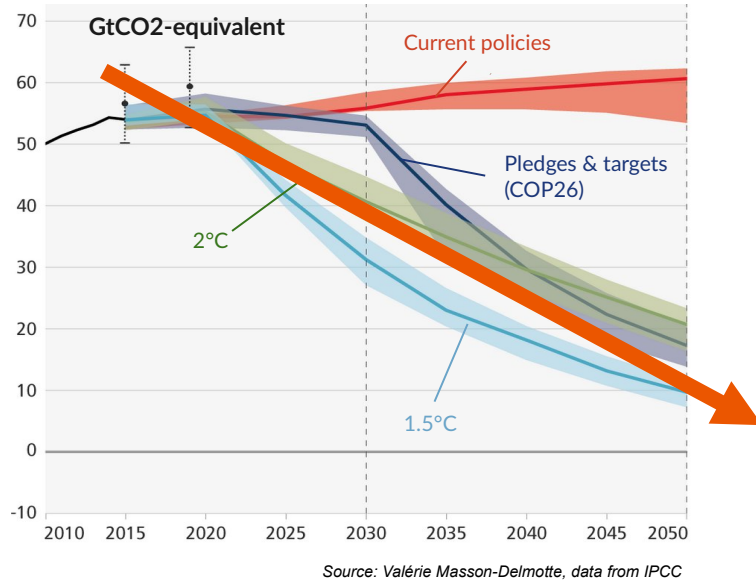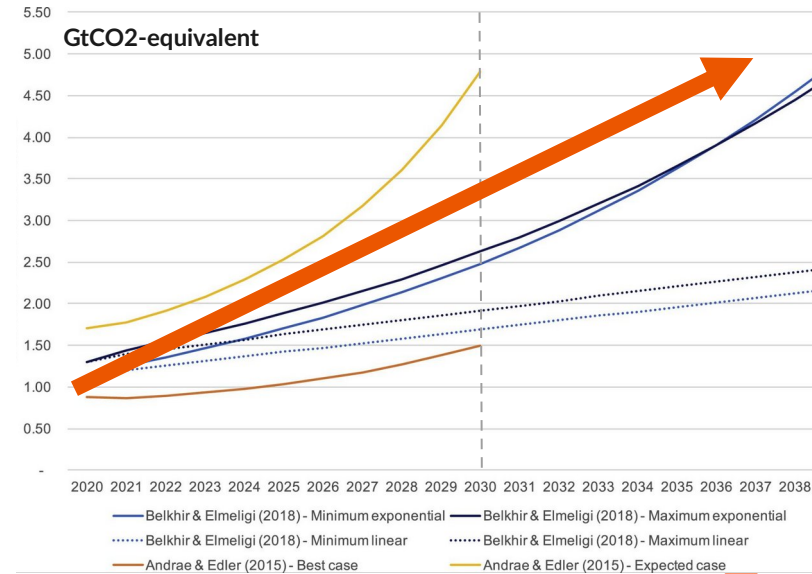
Green IT

Environmental impact of new technologies
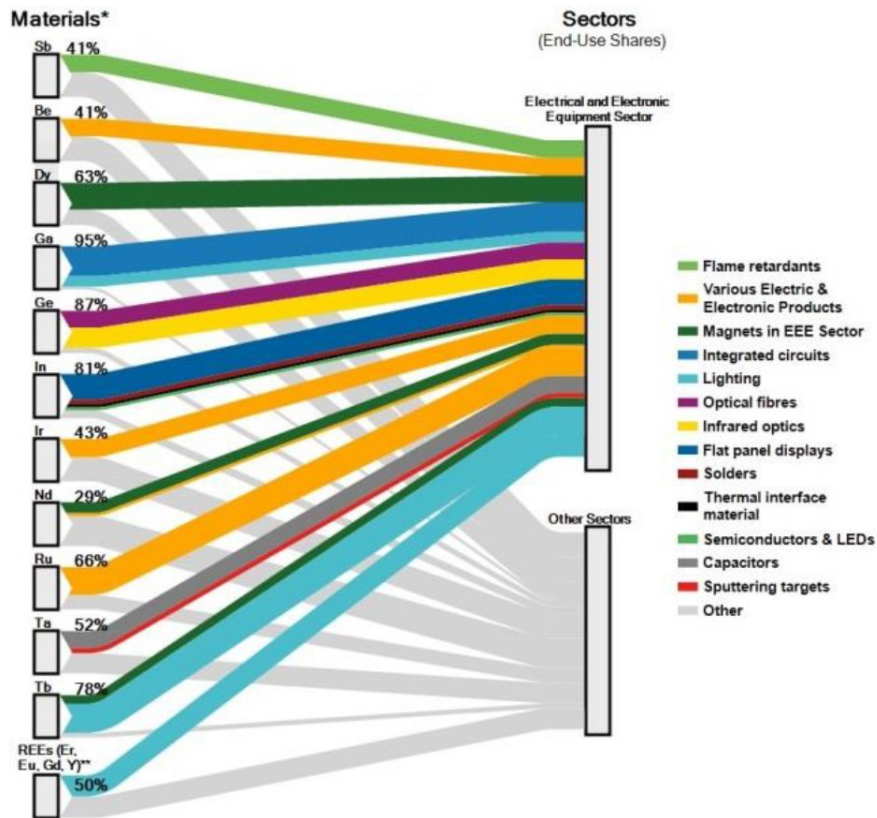
Growing GHG emissions

What we need to do:

Source: Valérie Masson-Delmotte, data from IPCC

VS

ICT industry =
2-4% global GHG emissions

Source: Projections of ICT's GHG emissions from 2020, Freitag et al. 2021

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Other env. impacts

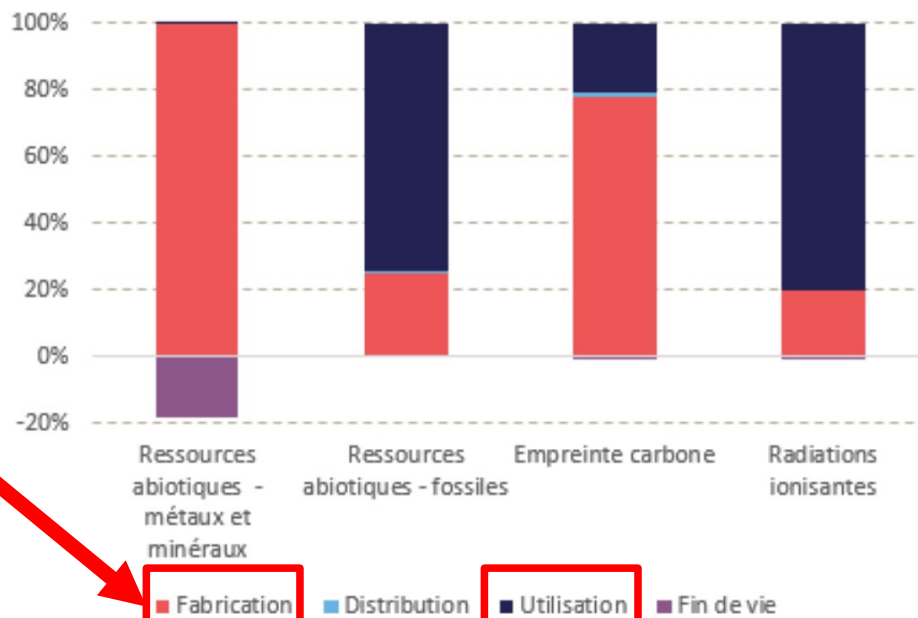Source: https://publications.jrc.ec.europa.eu/repository/handle/JRC108710

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Life cycle assessment

Life cycle assessment

Environmental impact of ICT in France, distribution by life cycle phase

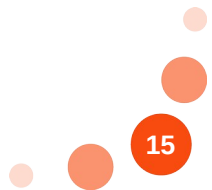Source: ADEME and ARCEP 2022

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Reduce this impact?

80% GHG emissions come from **manufacturing phase:**

- Buy less

- Share

- Repair

- Make it last

- ...

The rest from the **use phase:**

- Use less
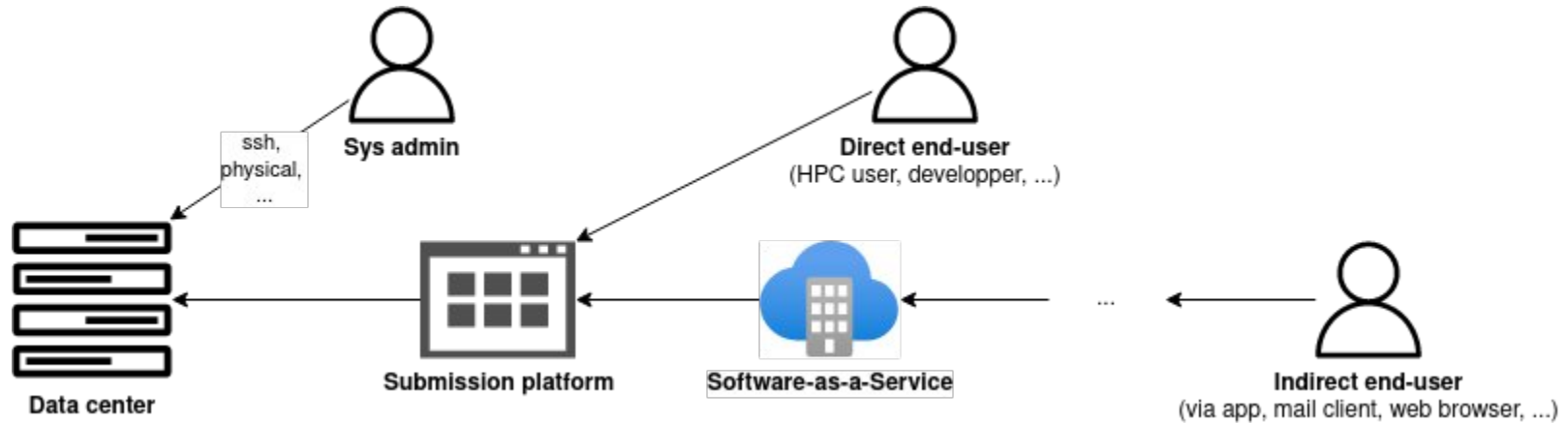
- Energy efficiency

- Minimalist designs

- ...

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My PhD

Digital Sufficiency in data centers
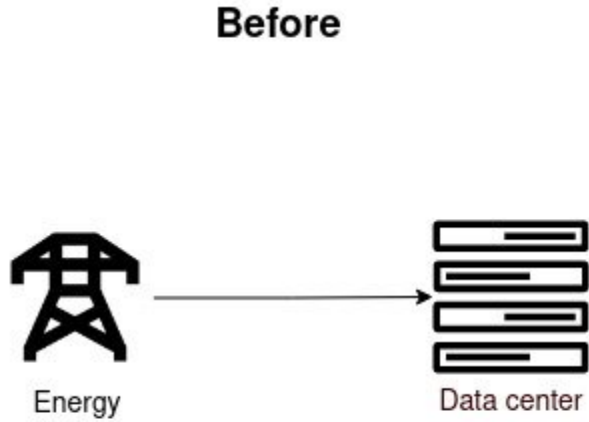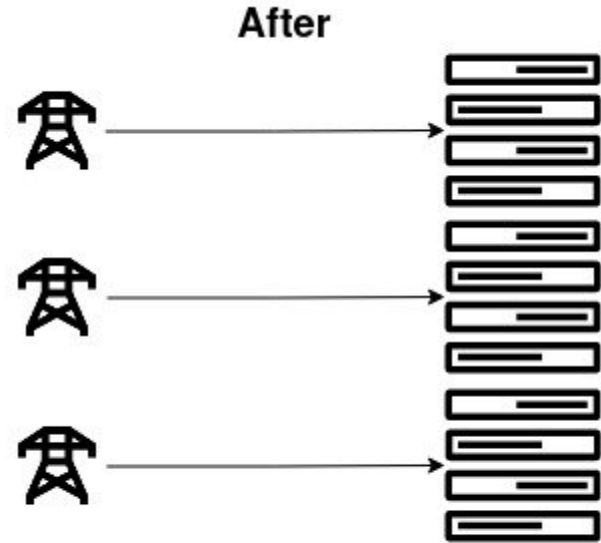
Users of a data center

Simulation work

Before

After

Energy → Data center

Less energy → Data center

Rebound effect?

Before

Energy → Data center

Data center = 1
Energy = 2

After

Data center = 3
Energy = 3

Submission behaviors

rigid (baseline)

renounce

delay

space degrad
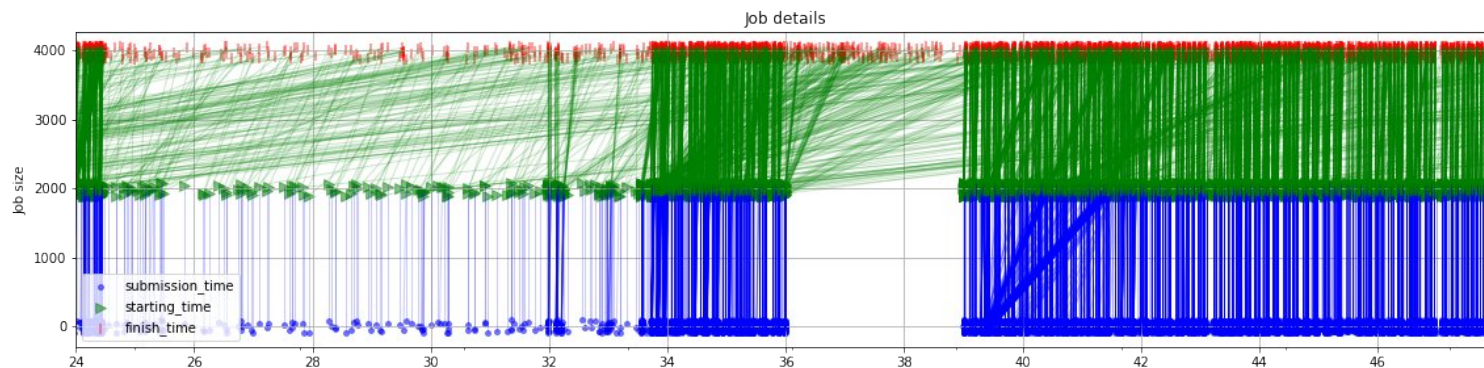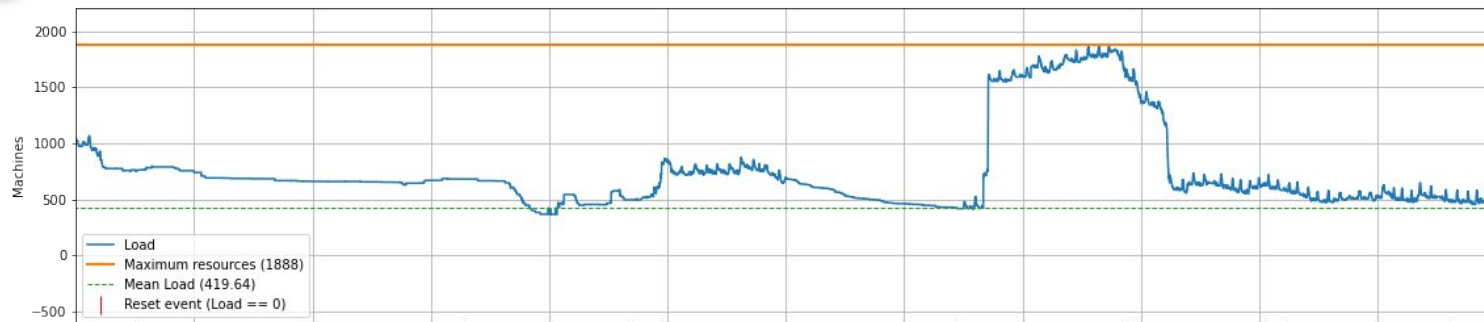
time degrad

reconfig
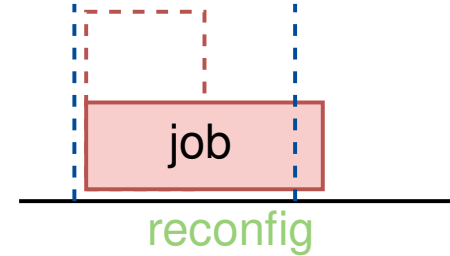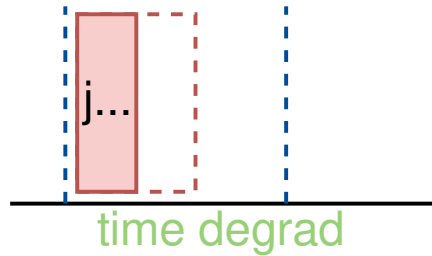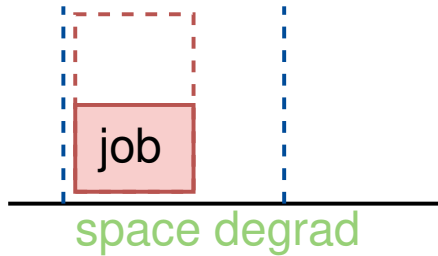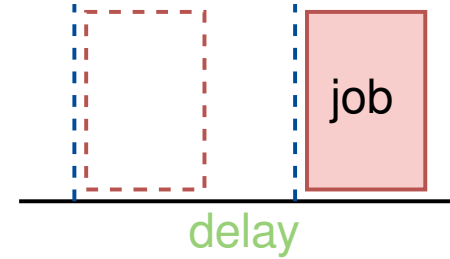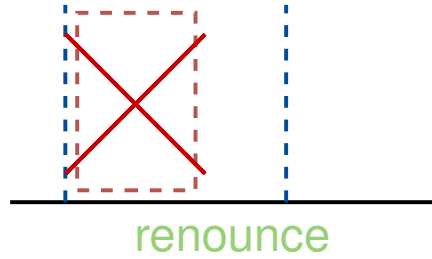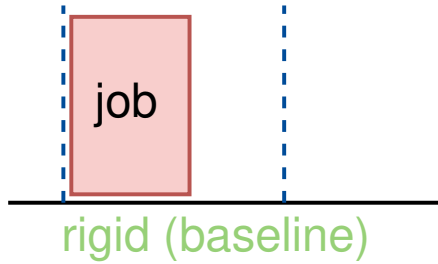
Rigid

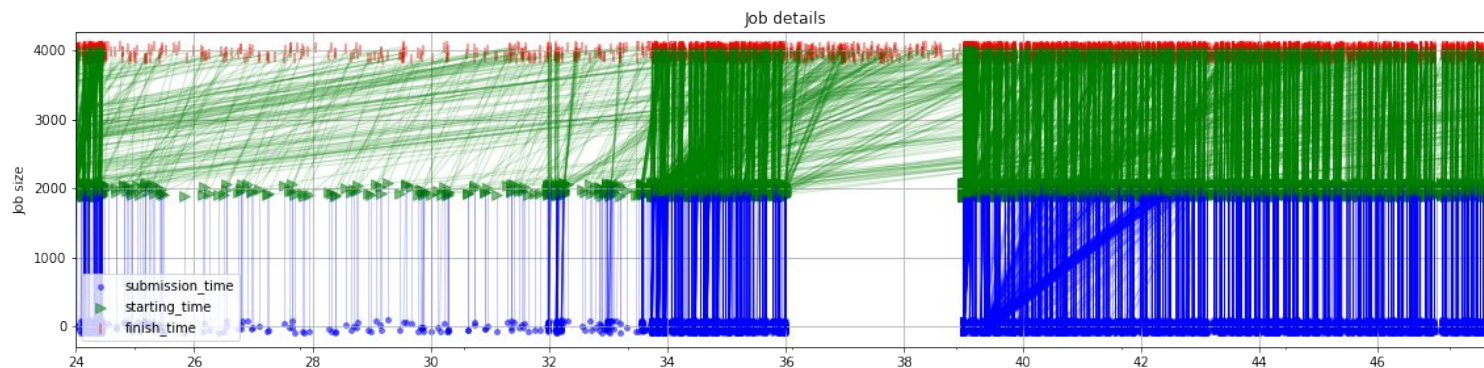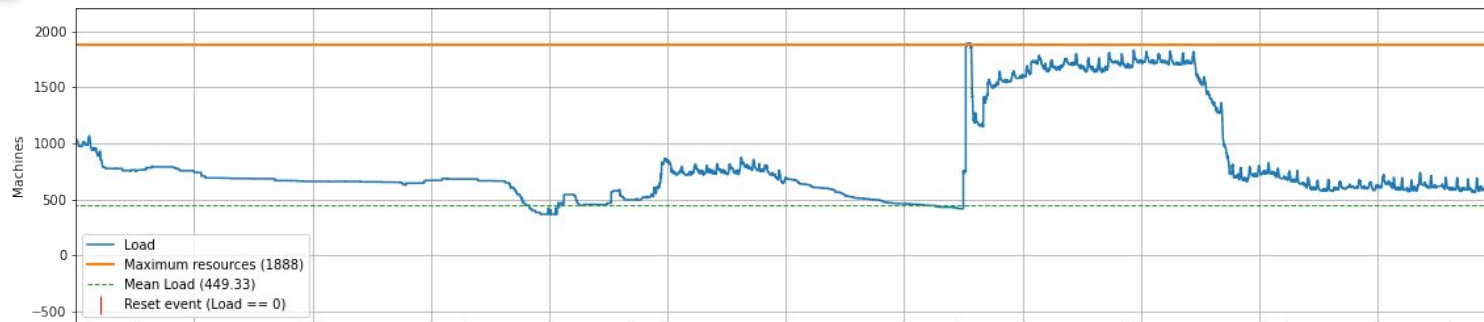../out/demand_response/ReplayRigid_may1_2_3
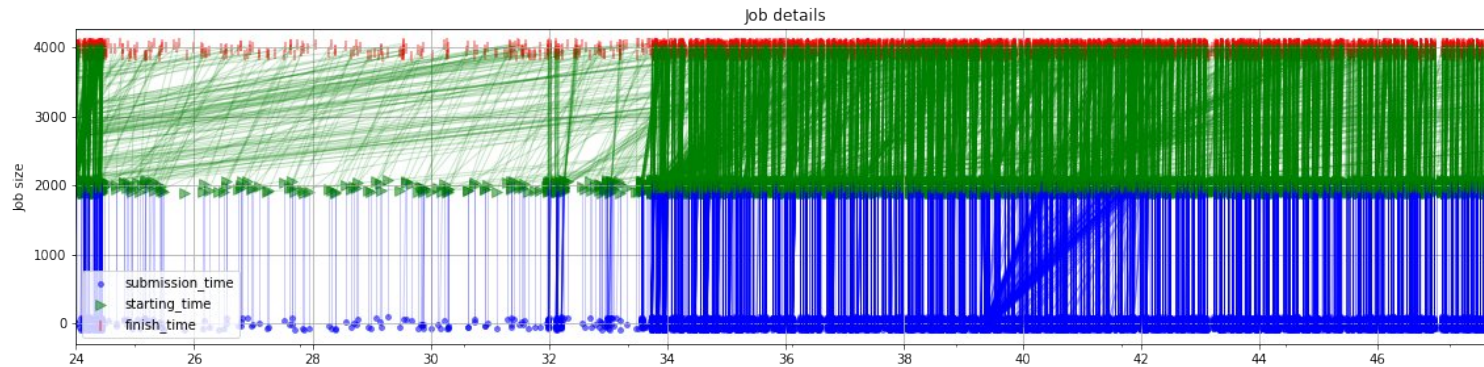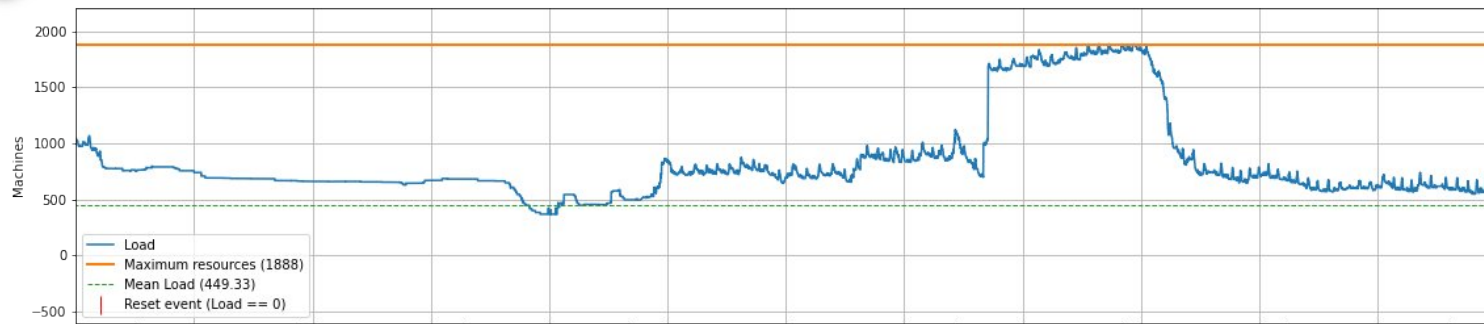
Renounce

../out/demand_response/DMRenonce_may1_2_3

Delay

../out/demand_response/DMDelay_may1_2_3

Users of a data center
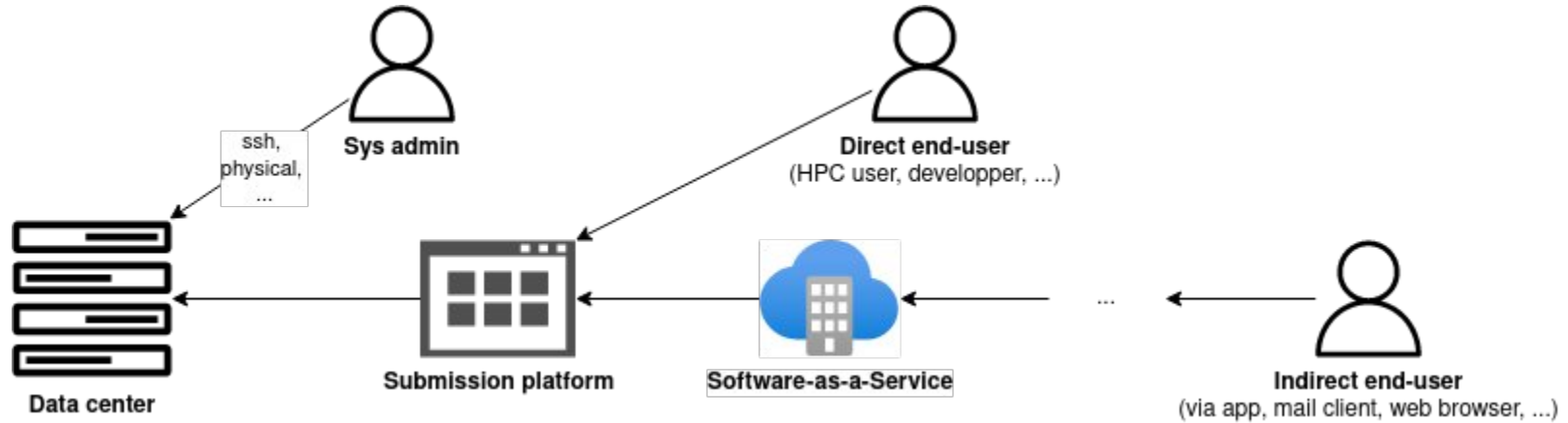
Digital *sufficiency* at work

- **Study goal:** Re-design the use of cloud services for flexible working towards sufficiency

- How much digital interventions are *necessary* and how much is *superfluous*?

- **Method:** Focus groups within companies

What is "flexible work" for you?
Describe the organisation of your working week

___

work-life balance
working hours
work locations

For each cloud-based daily task
Could you do without?

- If yes, how?
- If no, why?

___

Questions for **you** now

- How many digital devices do you own?

- How much time do you spend on the internet every day?

- Do you think that technology will save us?

- What is a *sufficient* computer / data center / smartphone app / ... ?

Conclusion

- New technologies have a **growing environmental impact**

  ○ 2-4% global GHG emissions

  ○ 80% in the **manufacturing phase** (in France)

- Need to rethink our **needs** for new technologies

  ○ Digital *sufficiency* ("sobriété numérique")

Thank you for your attention!

- **Any questions?**

- **Contact me**
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  - mael.madon@irit.fr