



UNIVERSITÉ DE TECHNOLOGIE  
COMPIÈGNE



COSTECH  
Connaissance, organisation et systèmes techniques

**Une approche du développement soutenable :  
l'innovation sociotechnique éco-conçue**  
cadre théorique et cas de recherche



Pascal Jollivet  
Coordinator of the CRI group in COSTECH  
24 janv. 2012  
Intervention au séminaire annuel DD&T (UTC)  
[jollivet@utc.fr](mailto:jollivet@utc.fr)

## Plan

- Introduction : quelle innovation, pour quel développement ?
- 1 - Un processus de production de valeur en mutation (dont la conception)
  - ◆ L'innovation
  - ◆ ... socio-technique
  - ◆ ... éco-conçue
- 2 - Cas de projets de recherches (an overview)
  - ◆ From Electronic Signature (SES, National Project);
  - ◆ To valuation and acceptability of bio-decontamination of soil (SnowMan, European Project).
  - ◆ And managing change in learning sustainable organizations (Pat-DD, Regional Project) ;
  - ◆ Projet "Alsace - Monnaie verte" (Ademe, National)



Conclusion : l'éthique est-elle rentable ?

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## Introduction : quelle innovation, pour quel développement ?

- Questionnement des liens entre :
  - ◆ Progrès technique & progrès social (course armement)
  - ◆ Progrès économique & progrès social (PIB/IDH)
  - ◆ Progrès économique et progrès environnemental (Erika):
    - ◆ La catastrophe écologique fait croître le PIB.
    - ◆ « Le PIB, le thermomètre qui rend malade »  
(idem pour la comptabilité privée RSFP ?)
- En quoi l'innovation *contribue-t-elle (ou pas)* à la *finalité* que l'on se donne en terme de développement (économique, social, humain, ...)



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## 1) Des processus de production de valeur (dont la conception) en mutation

- Socio-technical innovation ?
  - ◆ Usual : Innovation as *technical* engineering.
  - ◆ Alternative : Innovation as organisational, *social* and political *arrangement* (Deleuze).
  - ◆ Synthetic : Interdependence of dimensions : need of *socio-technical* innovation approach (Latour)
  - ◆ Ex. : the Secured Electronic Signature  
= algorithmic & politics
- Toward socio-technical *eco-conceived* innovations
  - ◆ Ex. : “engineering” social acceptability of technology uphill at the *conception level* of the innovation process (bio-decontamination of soil and valuation of bio-resources by local population)



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## Toward socio-technical *eco-conceived* innovations

The diagram illustrates a process starting with a green arrow labeled 'Technology' pointing towards a point where 'Environment' and 'Socio-economics' converge. This leads to 'Unsatisfying constrained technology' (in red). A yellow arrow then points to a green triangle with 'Environment' on the left, 'Socio-economics' on the right, and 'Technology' at the bottom. Inside the triangle is a yellow spiral, and the text 'Satisfying socio-technical eco-innovation' is written next to it.

An approach meant to cross :

- global performance (S. Shiba, 2007) & wealth indicators (A. Sen, 1999)
- life cycle thinking (O. Jollivet, 2005)
- sciences of complexity (E. Morin) for management change
- ... in order to integrate environmental, social and economic dimensions

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## 2) Overview of research projects (1) : Secured Electronic Signature (SES)

- SES in the ICare project (Nat.) : *conceiving/developing/diffusing ... techno-political devices/arrangements ...* for establishing & *guarantying trust* in organizations and society.
- SES = Algorithmic + Politics
  - ◆ Algorithmic : asymmetric double-key RSA cryptology algorithm relies on mathematics of long prime numbers decomposition. It can not be broken with today's technological capacities
  - ◆ Politics (institutional and social engineering/arrangements) :
    - ◆ Responsibility, Proof and Culpability : “*can you prove to me that my director will not be able to use my private key (for the use of which I'm legally responsible) ?*”
    - ◆ The “engineering” of the internal institution of “third body of trust” : “Who keeps the private keys ?”
      - From : a required participation of Union delegates ?
      - To : the 3 among 5 rule/governance of the access to private keys.

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### 3 research projects (2): SnowMan

- SnowMan (Eu): Valuation & acceptability of bio-decontamination of soil
  - ◆ Pb. : lack of trust by local population in technological programs for decontamination. Problem of *social acceptability*.
  - ◆ Sol. : a socio-technical eco-conceived innovation approach
  - ◆ *From* acceptability as “marketing” of already developed technological innovation ...
  - ◆ *To a socio-technical eco-conception & project management : acceptability via economic motivation/interestment of people ( local business models for bio-mass valuation as energy)*



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### 3 research projects (3): Pat-DD

- Pat-DD (Reg.) : Managing change in learning sustainable organizations
  - ◆ Pb. : promoting creativity & involvement in organization requires participative decision making processes that are very difficult to manage
  - ◆ Sol. : “Tools and methods for *participative* eco-conceived innovations and change management”
  - ◆ Ex. : Sustainable Hospital via technical waste prevention and treatment
    - ◆ Association of patients included in the conception team;
    - ◆ Software engineering for assisting the management of *participative* diagnosis and implementation



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## Research projects (4): Alsace

- Projet “Alsace – monnaie verte” (soumis, Ademe, National)
    - ◆ Partenaires : Véolia (filiale Mercur) (coord.), Banque (nationale), Ville, UTC
    - ◆ Finalité poursuivie :
      - ◆ Diminuer (facteur 4) l’impact environnemental ( vers une économie “verte”).
      - ◆ Endogénéiser et valoriser les externalités positives (ex : comportements “verts”)
    - ◆ Moyens :
      - ◆ Concevoir et mettre en place d’emblée un éco-système urbain/socio-économique (transport, habitat, système d’information ..
      - ◆ Valoriser et inciter via la création et l’animation d’une “monnaie verte”
- > vers la « mutation verte » du capitalisme contemporain ?



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## Conclusion

- Quelles motivations des entreprises pour développer des innovations socio-techniques éco-conçues ?
  - ◆ Compétition par l’innovation : innover (de façon systémique) ou disparaître;
  - ◆ Compétition par les « publics » : du « risque d’image » à la valorisation des intangibles (40% de val. du CAC 40)
  - ◆ l’éthique est elle rentable ?
- Tendances macro : vers une écologie de la matière et une économie de l’esprit ...



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