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Regulations as tool for innovation: the French “Grenelle de l’Environnement” case

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2. The “Grenelle de l’Environnement”
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1/ Regulations and innovation: a theoretical framework

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1/ Regulations and innovation: a theoretical framework
A/ Property and Construction industry

Analyse of innovation in a project-based industry, Gann and Salter (2000) :

1. Project-based firms (designers, project managers, constructors, specialist contractors, lawyers…),
2. Project supply networks (manufacturing firms…),
3. Projects actors (clients, owners, users),
4. Technology support infrastructure (education and R&D institutes, industry and professional associations…),
5. Regulatory and institutional framework (government, local authorities, industry associations…),
6. Knowledge flows.

Property and construction industry : a **project-based industry** (flow production) and a **service industry** (stock management) (Carassus et alii, 2006).

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1/ Regulations and innovation: a theoretical framework
B/ Systems of innovation

Systems of innovation (Edquist, 2000):

1. **Organisations** are formal structures ("the players");
2. **Institutions** ("the rules of the game") are "*sets of habits, routines, rules, norms and laws, which regulate the relation between people and shape human interactions*" (Johnson, 1992, p.26);
3. **Lock-in situations** ("*The enormous power of habits of thought in the economy constitutes a permanent risk for blocking potentially fertile learning processes*" - Johnson, 1992, p.29);
4. **Demand side instruments:** it includes laws, regulations, standards, public technology procurement.

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1/ Regulations and innovation: a theoretical framework
C/ Factors influencing the adoption of innovation

Rogers (1995) highlighted:

1. Relative **advantage** of the innovation;
2. **Compatibility** of the innovation with potential adopter's norms and habits;
3. **Complexity** of the innovation;
4. Ability of the adopter to **test** the innovation ("triability");
5. Ease of **evaluation** after trial ("observability")

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1/ Regulations and innovation: a theoretical framework
D/ Barriers to innovation in construction : a literature review

Barriers to innovation in construction:

- **Fragmentation** of the industry;
- **Inability to learn** from one project to the other;
- **Procurement process** mainly based on tendered price;
- **Low profit margin** in the industry;
- **Uniqueness** and the **complexity** of the final product;
- Characteristics of the operating environment: **highly regulated.**

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2/ The "Grenelle de l'Environnement"

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2/ The "Grenelle de l'Environnement"
A/ Low motivation before 2007

France was **late on environmental topics** (Godard, 2008)

- 1997: Kyoto agreement
- 2000: Climate Change National Program, Energy Efficiency National Program,
- 2004: Climate Plan,
- 2005: Energy Policy Program Law - "Factor 4 Policy"-

Low motivation:

- 2005: not a single text to implement the 2002 European Energy Performance of Buildings Directive (EPBD).
- First text, 2005 Thermal Regulation (May 2006) : not very ambitious (2000 Thermal Regulation energy consumption minus 15%)

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2/ The "Grenelle de l'Environnement"
B/ An original national negotiation

2007, after Presidential election, "Grenelle de l'Environnement" was an **original national negotiation:**

- between five bodies: government, local authorities, employers, unions and environmental associations,
- about four topics: climate change, biodiversity, environmental risks, health risks.

= **Mobilization of main national bodies**

First results: "Grenelle One" Law and Finance law (2009)

+ A lot of ambitious policy instruments between 2007 and 2009 for the property and construction industry

= **a coordinated action plan**

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2/ The "Grenelle de l'Environnement"
C/ A Coordinated Action Plan

In red:
Grenelle Property & Construction Industry Policy Instruments

Control and regulatory instruments		Economic and market-based instruments	Fiscal instruments and incentives	Support, information and voluntary action
Normative	Informative			
− Appliance standards **− Building codes** − Procurement regulations − Energy efficiency obligations and quotas	**− Mandatory audits** − Utility Demand-side management programs − Mandatory labelling and certification programs	**− Energy performance contracting** − Cooperative procurement **− Energy efficiency certificate schemes** − Kyoto Proto-col flexible mechanisms	**− Taxes** **− Tax exemptions / reductions** − Public benefit charges **− Capital subsidies, grants, subsidized loans**	**− Voluntary certification and labelling** **− Voluntary and negotiated agreements** **− Public leadership programs** **− Awareness raising, education, information campaigns** − Detailed billing and disclosure programs

Policy instruments typology source: UNEP 2007

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2/ The "Grenelle de l'Environnement"
D/ Main Grenelle building regulations

Grenelle Buildings Codes:

- **Energy/CO2 Certificates,** for new and existing buildings (2007-2008)
- Thermal building **regulation for existing buildings** (2007)
- Mandatory **Renewable Energy Studies** before building or renovation permit (2008)
- **Voluntary labels,** specified by government, for new and existing buildings (2007, 2009)
- **Thermal building regulation** for new buildings, under discussion (2012)
- **Future** « Positive Energy Buildings » **thermal building regulation** for new buildings (2020)

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2/ The "Grenelle de l'Environnement"
E/ A huge jump

A huge quantitative (and qualitative) jump for Property and Construction Sector:

- **New buildings**
  - . **2012** Thermal Regulation = 2005 Thermal Regulation energy consumption **minus 50 %**
  - . **2020** Thermal Regulation = 2005 Thermal Regulation **minus 100 %** ("Positive Energy Buildings") = minus 70 % + 30 % renewable energy produced by the building

- **Existing buildings**
  - . **2020** stock consumption = 2009 stock energy consumption **minus 38 %** (from 240 KWh/m²/y to 150 KWh/m²/y primary energy)

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3/ The impact of regulations on innovation

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3/ The impact of regulations on innovation
A/ Regulations, a stimulus for innovation

Grenelle Regulations is a way to **stimulate innovation:**

1. **Effinergie Low Consumption voluntary label**
   - Positive impact on holistic design, building air tightness, products performance (windows, insulation devices, heat-pump and other equipment reducing energy consumptions, energy saving lights),
2. **Energy/CO2 Certificates** (when mandatory in advertisements)

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3/ The impact of regulations on innovation
A/ Regulations, a stimulus for innovation

Some actors are **anticipating** future 2020 Thermal Regulation (« Positive Energy buildings »).

To be diffused any innovations complying with future Thermal Regulation have to :

- bring a **competitive** advantage;
- be **tested** (“triability” of the innovation);
- be **evaluated** after trial (“observability” of the innovation – Rogers, 1995).

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3/ The impact of regulations on innovation
B/ Regulations, a barrier to innovation

2005 Thermal Regulation

- innovative in comparison with 2000 Thermal Regulation
- **now a barrier:** Low Consumption innovative techniques not included in calculation model.

"Static performance-based building regulations" versus future 2012 Thermal Regulation ("flexible performance-based building regulations")?(Gann et al., 1998).

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3/ The impact of regulations on innovation
C/ Criteria for successes

Regulations associated with the "Grenelle de l'Environnement" is a way to solve market failures. Its success requires:

- To **articulate** regulations with financial and training disposals.
- **To overcome lock-in situations :**
  - Investors fail to internalise environmental damage;
  - Industry forces and educational institutions are perpetuating skills and resources needed to maintain the old system;
  - Citizens have adapted their life to the old system (no resource scarcity, no impact on the environment).

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Conclusion

Necessity to create **a new paradigm** for the whole chain

- Project-based firms: **new relationships** between architects, engineers, contractors and clients, performance-based management by facilities manager,
- Project supply networks: innovative financial engineering, collaborations with contractors;
- Projects actors: **performance-based** client brief, green lease for user,
- Stock managers: **environmental** asset and property management,
- Technology support infrastructure: R&D to develop **radical innovations**, training by industrial and professional associations.

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