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

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1/ Regulations and innovation: a theoretical framework

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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 alli, 2006).
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.

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")
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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France was late on environmental topics (Godard, 2008)
- 1997: Kyoto agreement
- 2000: Climate Change National Program, Energy Efficiency National Program,
- 2004: Climate Plan,

**Low motivation:**
- First text, 2005 Thermal Regulation (May 2006): not very ambitious (2000 Thermal Regulation energy consumption minus 15%)

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
### 2/ The “Grenelle de l’Environnement”
#### C/ A Coordinated Action Plan

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#### D/ Main Grenelle building regulations

**Grenelle Buildings Codes:**

- **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)
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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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)

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 ("trialability" of the innovation);
• be evaluated after trial ("observability" of the innovation – Rogers, 1995).
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.


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).
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.

References


Thank you for your attention

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