

**French Institute
of Science and Technology
for Transport, Development
and Networks**

Welfare implications of compensation for environmental damages

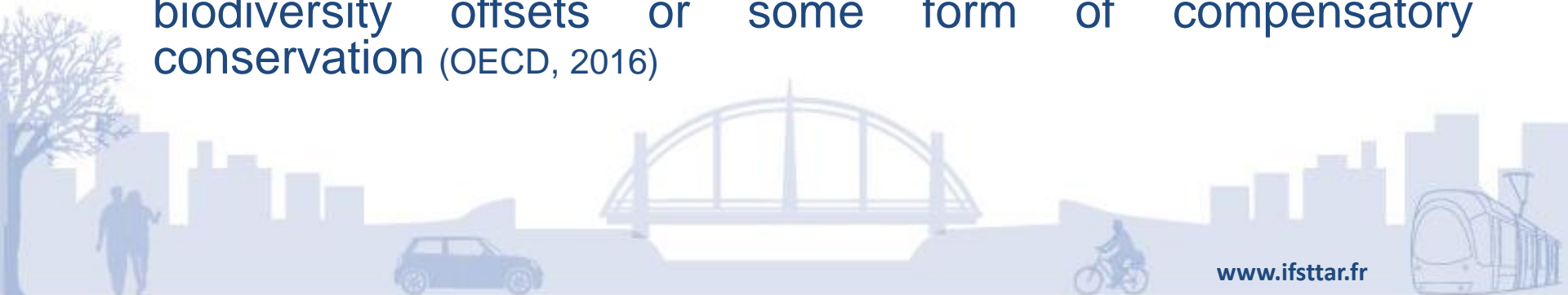
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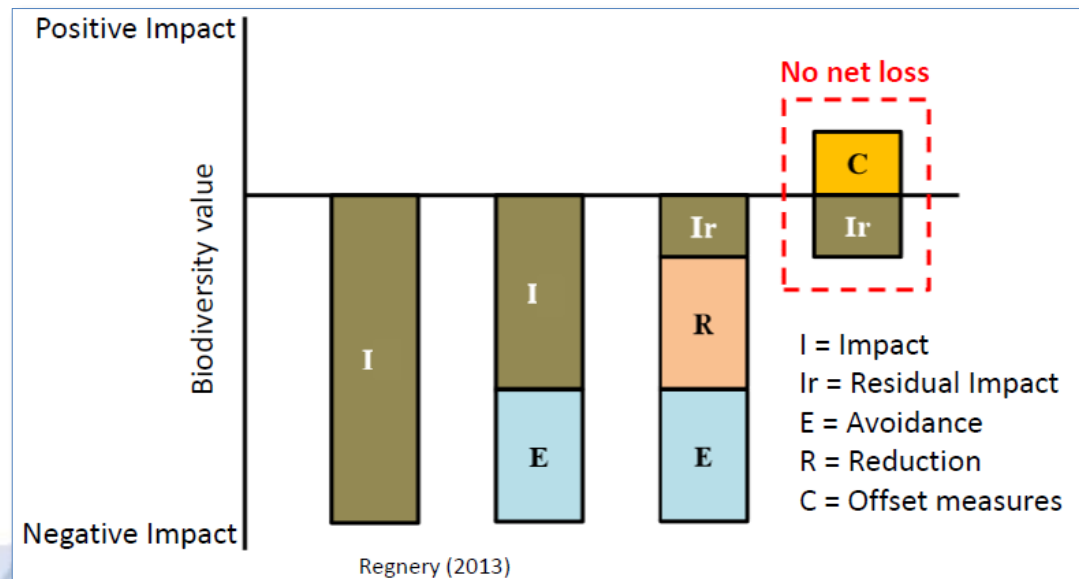
Context

- Environmental degradation due to land development has become a concern for the policy makers.
- Biodiversity offsetting is a policy approach that has been designed to address these adverse impacts of development activities in line with the '*polluter pays*' principle.
- Biodiversity offsetting is perceived as a mean to reconcile development and conservation.
- At least 56 countries have laws or policies requiring biodiversity offsets or some form of compensatory conservation (OECD, 2016)



Biodiversity compensation

- Goal: preserve biodiversity in the context of development projects
- How: compensate the negative significant residual impacts on biodiversity by positive actions (offset measures) on biodiversity
- Offsets measures must be applied at the end of the mitigation hierarchy

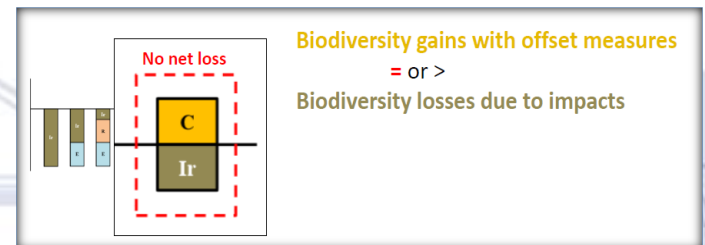


Example : the french legal and regulatory framework

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- 1976 **Law on nature protection:** 1st reference to the mitigation hierarchy
 - 2004 Constitutional law on the environment: reference to sustainable development
 - 2007 Protected species derogations « the net result of a derogation should be neutral or positive for a Species » (EC 2007 Guidance)
Consultative process « Grenelle de l'environnement »
 - 2009 Grenelle Law I
 - 2010 Grenelle Law II
 - 2012 National doctrine on the mitigation hierarchy
National guidelines on the mitigation hierarchy
 - 2014 *First parliament review of draft law*
 - 2016 August 8th: adoption of the **law on « recovering » biodiversity, nature and landscape**

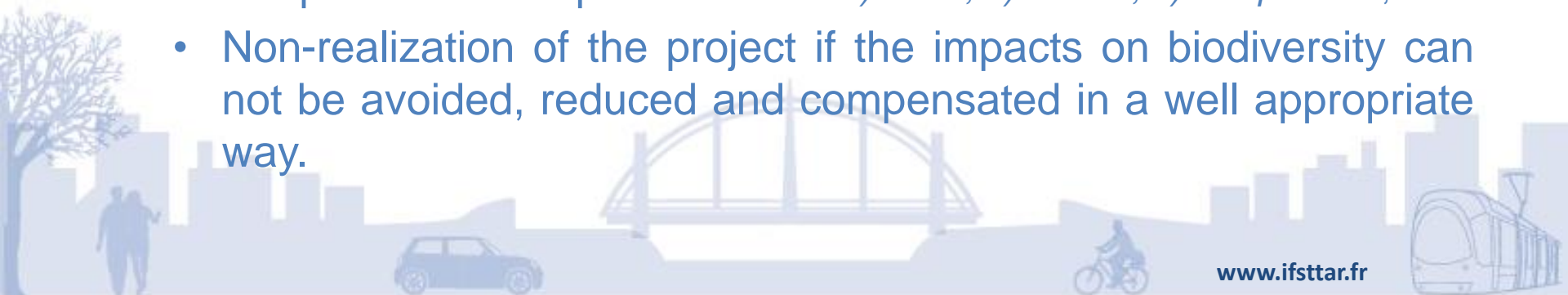
Law on « recovering » biodiversity, nature and landscape (2016)

- Introduction of the mitigation hierarchy definition within the text and NNL principle
- « *The principle implies to avoid the damages to biodiversity and the services it provides; otherwise reduce the damages and in last step compensate the impacts that were not avoided neither reduced, considering the species, the natural habitat and the ecological functions that were impacted »*
- « *The principle aims at achieving a no net loss objective, or tending to a gain of biodiversity »*



Key principles

- Principle of sustainability;
- Ecological equivalence (« like for like » requirement);
- Proximity for measures implementation (for ecological reasons);
- « Results obligation »:
 - Respect of the sequence order: 1) *avoid*, 2) *reduce*, 3) *compensate*;
 - Non-realization of the project if the impacts on biodiversity can not be avoided, reduced and compensated in a well appropriate way.



A significant shift: from value to cost of the ecological compensation measures

- Environmental compensation based on physical criteria;
- Experts view (*'as biodiversity is a complex system, public is not able to correctly assess the needed compensation'*);
- Biodiversity offsetting policies weigh against the use of stated preference surveys and focus their attention on determining the cost of activities necessary to restore or replace impacted natural resources.
- **'Are economists becoming bystanders?'** (Meyerhoff & Hartje, 2008)



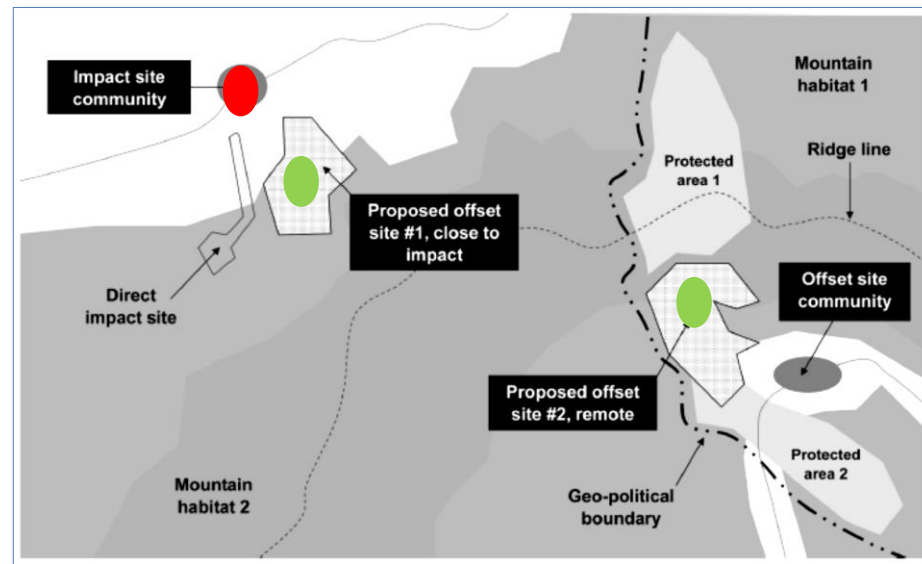
Equivalency methods are not perfect

- Residual role of monetary valuation. Non-market valuation methods: there are still open questions with respect to the validity and reliability ... but equivalency methods are also far from being perfect.
- Environmental compensation fails to take into account some issues: this technical perspective omits other dimensions such as the quality of human lives, the social use values, access to resources, equity,...



Example: spatial exchange of biodiversity

- Example of one community affected by the project impact alone and another community affected by the biodiversity offset, but not the project impact.



Source: BBOP (2009)

- Social equity issues can arise when offsetting redistributes public access to land conservation value because offset sites are located far from where biodiversity is affected.

How economist may help to enhance the compensation?

We can use economics to achieve a better compensation **without change minimal No Net Loss (NNL) requirements.**

- i. Scale compensation when equivalency methods are not appropriate;
- ii. Determine the optimal balance between equity and cost-efficiency;
- iii. Guide NNL requirements;
- iv. Know more about preferences for NNL.



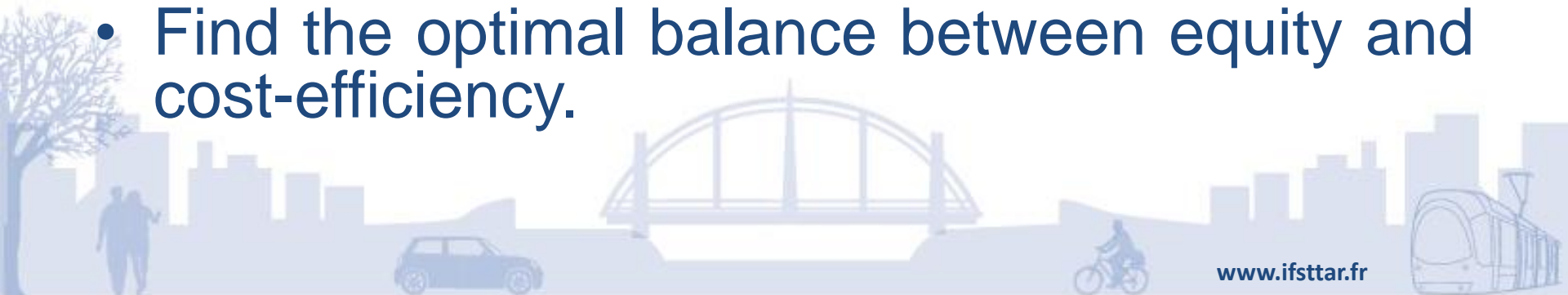
1. Alternative scaling approach

- “If it is not possible to use the first choice resource-to-resource or service-to-service equivalence approaches, [...] the competent authority may prescribe the method, for example monetary valuation, to determine the extent of the necessary complementary and compensatory remedial measures” (Directive 2004/35/CE)
- **Value-to-value:**
 - Criteria are not met for equivalency approach
 - Approach and method meet cost, timeframe and validity criteria
- **Value-to-cost:**
 - Equivalency approach not appropriate;
 - Valuation of lost services is possible, but valuation of replacement services cannot be done within reasonable timeframe and/or at reasonable cost



2. Optimal balance between equity and cost-efficiency

- Equity refers to the idea that each agent suffers differently from the damage and benefits differently from the compensation;
- An efficient compensation will consist in ensuring no change in aggregate welfare while maintaining a minimum level of costs;
- Find the optimal balance between equity and cost-efficiency.












3. Guide NNL requirements

- The economics framework can help us to guide the NNL requirements;
- Example : ‘Distance-decay effect’, individual’s willingness to pay is dependent to the distance between its residence and the location of the environmental good;
- Using available social data it is therefore possible to be more demanding on the quantity of compensation or its location in order to reduce the inequalities potentially created.



4. Reveal preferences for NNL

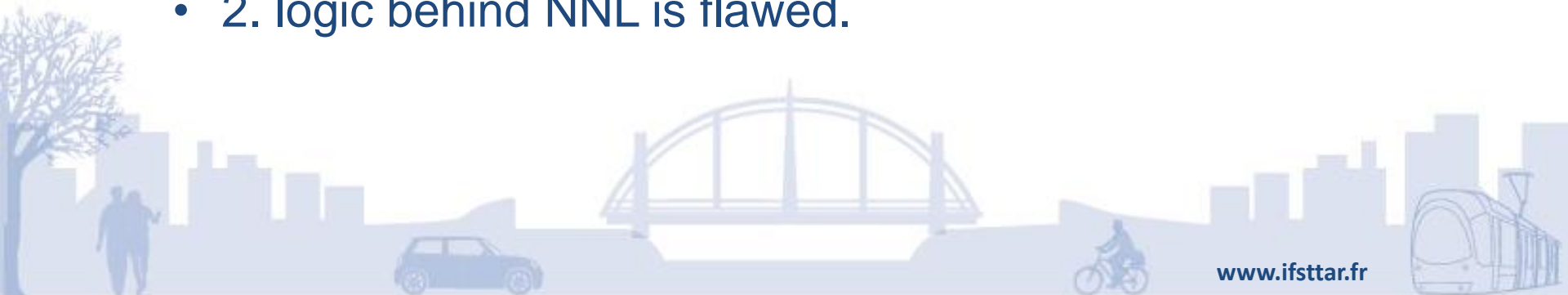
- Environment valuation methods can help to reveal preferences for NNL measures.
- Example: choice experiment to reveal individual preferences for compensation rules in the case of forest clearing due to road building (national survey).

	A	B	C	D
Number of trees to be replanted for each ten trees destroyed	 10:10	 15:10	 10:10	No trees are replanted
Maximal distance between the clearing site and the reforestation site	 25 km	 25 km	 10 km	
Maximal number of years between the clearing and the reforestation	 3 years	 3 years	 5 years	

Example of choice card

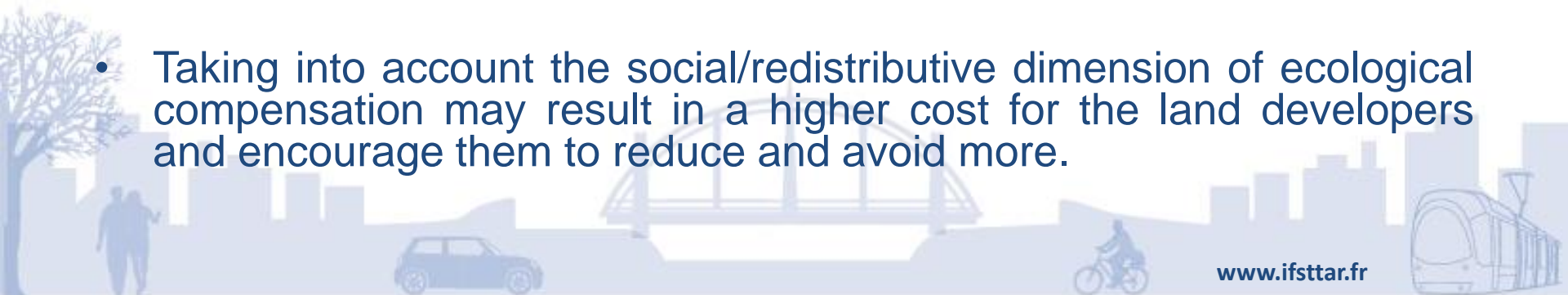
4. Reveal preferences for NNL

- Heterogeneity of individual preferences (tradeoffs between the three attributes: ratio, distance, time)
- Individual preferences depend on socio-economic characteristics;
- If public perceptions do not match with NNL requirements...two plausible explanations: (Bull et al., 2017)
 - 1. change the preferences: educate public stakeholders;
 - 2. logic behind NNL is flawed.



Conclusion

- Ecological compensation measures must primarily be based on ecological criteria
- ...but biodiversity offsetting is not socially neutral;
- The rejection of monetarisation need not necessarily mean banning economists.
- Economists can give some insights that may help to offer more acceptable compensation. For example:
 - Which are the individual preferences and the collective preferences for NNL?
 - Which substitution is acceptable?
- Taking into account the social/redistributive dimension of ecological compensation may result in a higher cost for the land developers and encourage them to reduce and avoid more.



Thank you for your attention

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