HQE2R (ISDIS system and INDI model) – Tool Summary

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Info

Date:
2002-2003

Place of origin:
EU, France

Homepage:
http://www.assohqe2r.org

References:
- HQE2R, 2003a. HQE2R sustainability circles.
- HQE2R, 2003b. The 5 objectives and 21 targets for sustainable neighbourhoods and buildings.
- HQE2R, 2003c. The HQE²R approach theoretical basis, approach and tools.
- Outrequin, P. & Charlot-Valdieu, C., 2002. State of the art review of indicators and systems of indicators (ISDIS), HQE2R.
- Outrequin, P. & Charlot-Valdieu, C., 2003. The ISDIS system Integrated Sustainable Development Indicators System & the INDI model: Assessment of neighbourhood regeneration scenarios, action plans, HQE2R.

Latest use:
2002 – 14 case study neighbourhoods in 7 EU countries.

Download:
http://www.assohqe2r.org

Description
- HQE2R (Sustainable renovation of buildings for sustainable neighbourhoods)
- ISDIS system (Integrated Sustainable Development Indicators System)
- INDI model (INDicators Impact)

"The objective of the project is to develop a new methodology or approach together with the necessary methods and tools to promote sustainable development and the quality of life at the urban neighbourhood level. HQE2R aims at providing decision aid tools for municipalities and their local partners, focussing on neighbourhood inhabitants' and users' concerns. With its integrated approach, it aims at providing a framework, which can be generally applied to

European cities. The project uses case studies as neighbourhood models for which the tools are elaborated and in which the approach or the different tools can be tested.[…]
The aim of HQE2R project is thus to allow local authorities to implement regeneration action plans in their neighbourhoods and for the renovation of their buildings towards sustainable development. It is a question of providing operational tools for a concrete analysis and evaluation, which are open to public (and private) debate and to action." [Outrequin et al. 2003, p.8]
"This report aims at the presentation of an entire group of sustainable development indicators adapted to the neighbourhood and to the building scales, which should be adopted and measured in order to translate, in an indisputable way, the minimum expectations of a neighbourhood as well as off its buildings when moving towards sustainable development." [Outrequin et al. 2003, p.11]
"The INDI (INDicators Impact) model is an assessment model of projects or scenarios, which has been elaborated from the integrated sustainable development indicators system (ISDIS) identified in the HQE2R project. The model assesses the evolution of the neighbourhood. […]
A neighbourhood profile could be presented on the basis of the 61 indicators selected. However aggregations per target on the one hand and per objective on the other hand seem to us better to give a readable result." [Outrequin et al. 2003, p.4]
"To sum up**, the ISDIS system is** therefore **a systematic analysis tool** which simplifies the reality but **proposes a global approach of the main questions to be asked so as to define the position of a neighbourhood in a sustainable development perspective**.
The indicators of ISDIS analysis system have been adapted so as to be used in an evaluation system**. The ISDIS system includes Sustainable Development indicators representing the five objectives and the twenty-one targets selected.
The system has been conceived by distinguishing for each target the main **key issues** which correspond to problems to solve at the neighbourhood level." [Outrequin et al. 2003, p. 16]

Key Theoretical Background

"This report is the first part of the project's "Deliverable 9" on HQE2R-Sustainable development key issues and indicators. It presents the **state of the art** and discusses the origins and use of environmental indicators and the issues which have arisen in transforming these into indicators of sustainable development. In this context the OECD and European Environment Agency indicators systems are fundamental: The OECD indicators system (PSR) assesses Pressures on the environment from human activities, how these modify the State of the environment, and what Responses are made by the community to these changes. A more elaborate approach has been adopted by the European Environment Agency. This (the DPSIR system) makes the socio-economic Driving forces of change more explicit, and analyses the Impact of the resulting modifications of society and of its ecosystems more clearly." [Outrequin et al. 2002, p.3]

"The aim is to provide a **system of minimum sustainable development indicators which allows to carry out the inventory and the sustainable development diagnosis of a neighbourhood.**

The system of indicators proposed has been dealt with and selected by CSTB and La Calade in collaboration with 8 European research centres, after a long process of discussion in order to have a European consensus, as being the **representative of the sustainable development elements at the level of neighbourhood and its buildings.**

A debate between partners has lead to propose a **common indicators system**. Compromises were necessary to keep a balance between the will of getting the more relevant indicators and the costs of the measurement of these indicators in each country. The ISDIS represents also a compromise between the most important topics for each partner, into each target and key issue. So we can consider this system as a relevant system at the European level (at least for seven Member States)." [Outrequin et al. 2003, p.15]

SUD Framework

"The choice of 6 sustainable development principles at the scale of the city and a definition of sustainability for the neighbourhood scale. The definition of a overall methodological framework with 5 main global sustainable development (SD) objectives, their 21 targets, 51 key issues or sub targets and then 61 indisputable indicators at the neighbourhood and building scales (the ISDIS system)." [Outrequin et al. 2003, p.10]

The 5 sustainable development objectives:
1. TO PRESERVE AND ENHANCE HERITAGE AND CONSERVE **RESOURCES**
2. TO IMPROVE THE QUALITY OF THE **LOCAL ENVIRONMENT**
3. TO ENSURE **DIVERSITY**
4. TO IMPROVE **INTEGRATION**
5. TO REINFORCE **SOCIAL LIFE**

And for the 6 sustainable development principles (no source):
1. Environmental
2. Social
3. Economic
4. Governance
5. Long term
6. Global

"The indicators have been defined in accordance with the structuring **objectives** of sustainable development, which have been developed into **21 targets and 51 key issues**. For each of these targets and key issue, one or more indicators are proposed. These indicators must facilitate thinking by local authorities and their local partners in view of the implementation **of specific actions**, which in return must facilitate the short-, medium- and long-term improvement of one or more indicators." [Outrequin et al. 2003, p.11]

"All of the indicators proposed constitute a **global system**. In the same way that sustainable development must be considered a **cross-cutting approach** combining the environment, economic, social and governance factors, the indicators of sustainable urban development on the scale of neighbourhoods and their buildings must be analysed as a whole in order to take existing or potential interactions into account.

This is why each of the indicators used is also the subject of a detailed description which obviously includes the method(s) of measurement, units, etc. and also concrete examples of actions which cities and their partners can implement." [Outrequin et al. 2003, p.11]

Input

"Indicator Definition: An indicator is a variable, whose values may reveal a state or a phenomenon. The specificity of an indicator is its significance, i.e. it gives a meaning to a phenomenon. Indicators are of a different nature according to the nature of the phenomena to be measured or of the problems posed." [Outrequin et al. 2003, p.12]

"At the same time, this system of indicators [ISDIS] may be used as a **tool to evaluate** scenarios, proposals and projects." [Outrequin et al. 2003, p.12]

"For the definition of projects and plans of action:

Evaluation indicators allow to assess an action impact in time and are related to a specific project. They can be assessed before analysis according to the expected impacts of the project to be carried out, on the basis of state indicators, and compared with threshold values (benchmark). They can also be given target values in the short, medium or long term." [Outrequin et al. 2003, p.13]

"The INDI model includes globally the **61 SD indicators from ISDIS** distributed in 51 indicators concerning the neighbourhood level, and 36 indicators concerning buildings; in this total, 26 indicators are common (see table 3, INDI using the indicators from ISDIS).

For a model, the total number of indicators appears as a compromise between, on one hand, the will to propose a simple and easy to use decision aid model which participates to the decision process, and, on another hand, the necessity to cover all the fields of the sustainable development at the neighbourhood and buildings level.

Each target is covered by two to four indicators [...]" [Outrequin et al. 2003, p.22]

Table 3 - Distribution of the INDI system indicators

SD Objectives	Specific indicators for the non built elements (structures and uses)	Specific indicators for buildings (structures and uses)	Common indicators for the buildings and non built elements	Total
Heritage and resources	6	4	7	17
Quality of the local environment	6	6	9	21
Diversity	2	-	6	8
Integration	9	-	1	10
Social life	2	-	3	5
Total	**25**	**10**	**26**	**61**

Source: HQE^{2}R

"So these different indicators are expected:
- To **produce meaning:** producing figures does not produce meaning.
- To be **measurable** according to periodic cycles (reproducibility of the measurement) at costs that are acceptable to the local decision-makers and developers: these measurements should be consistent at a European level.
- To be **comparable** in time (the principle of uniform: the method of calculation does not change over time) and space.
- To work towards and respond to the necessity to observe in order to implement **actions**.
- To be representative of the local sustainable development stakes but also be able to integrate the objectives of sustainable development expressed at the European level." [Outrequin et al. 2003, p.12]

Methods
"The reference values can be **averages** obtained from the city's neighbourhoods as a whole (the neighbourhood will thus be positioned in relation to the other neighbourhoods in the city), **threshold** values to be observed (statutory threshold for health and safety), **objective** values (linked, for example, to European directives: air quality; noise, etc.; or to the objectives of national or European policies: greenhouse effect, etc.)." [Outrequin et al. 2003, p.12]
"Each indicator is therefore assessed for a neighbourhood, individually in regards to an initial situation then to new situations caused by a project or a scenario. Different scenarios can be studied in the same time and for each scenario, the evolution of each indicator is assessed. The model user will have to move each indicator value according to each scenario or project that the user studies.
The model proposes aggregation functions of indicators according targets and SD objectives. To make possible this aggregation, the INDI model proposes for each indicator a value function which marks the indicator on **the sustainability scale**.
The elaboration of this sustainability function depends on **benchmark values** which allow considering that an indicator is on the way of the sustainability or not.
These **sustainability functions** have been created, as well as the benchmark, for each indicator. However, a quantitative measure is not always possible and the value functions are sometimes only qualitative.
The aggregation of indicators allows comparing scenarios or projects according to the different targets and objectives. […]
"The value will then be expressed on a sustainability scale ranging from -3 (non-sustainable) and +3 (sustainable). This expression is made by the model, where threshold values (benchmark) as well as the sustainability function attributed to each indicator are specified." [Outrequin et al. 2003, p.21-23]

Figure 2 - Example of the indicator value on the sustainability scale
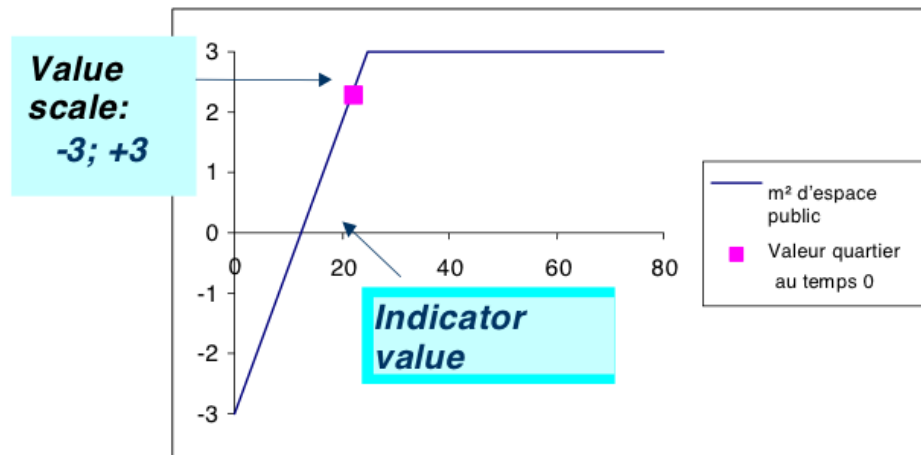
Output

"The aim is not to choose the best scenario or project but only to support decision-makers in the choice. In fact, it will be very rare that a scenario will be better than another for all the 21 targets or all the 5 objectives. So the solution often will be a mix between different solutions. On another hand, the model does not calculate a financial cost of projects. The different proposed solutions must also take into account this element.

The aim is more really to **open the discussion** between the different stakeholders and owner services in order to put into relations all the elements of a sustainable development. The INDI indicators take also into account the six SD principles and must incite the decision-makers to include in their own decision process all the SD principles and more particularly **the long term impacts** and **the social and environmental impacts**." [Outrequin et al. 2003, p.22]

"The measurement of all the 61 indicators allows **placing the neighbourhood characteristics upon a sustainability scale, and then assessing the possible evolutions of the neighbourhood on this same scale,** according to the selected projects. It is then possible to **measure the impacts of actions or scenarios** for each target, for an objective or for the 5 sustainable development objectives selected.
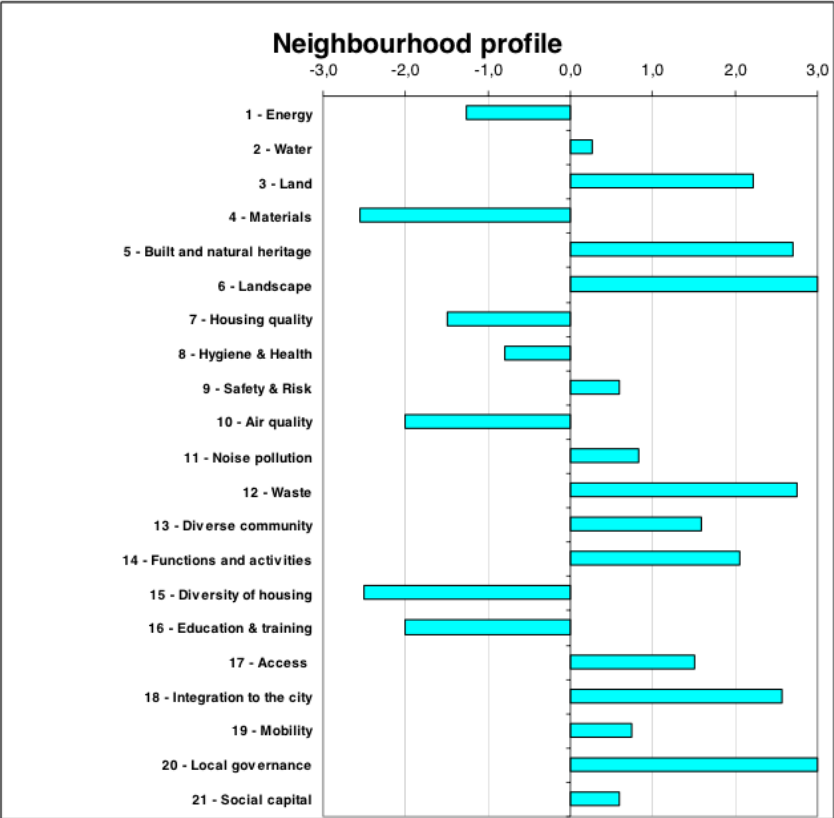
A neighbourhood profile could be presented on the basis of the 61 indicators selected. However aggregations per target on the one hand and per objective on the other hand seem to us better to give a readable result.

Some aggregation rules for indicators per target and then for targets per objective have been defined. Several aggregation methods were selected according to the indicators' or targets' nature: indicators arithmetical average (or targets arithmetical average), weighted average, minimum value, etc." [Outrequin et al. 2003, p.26]

"The measure of indicators for a neighbourhood allows defining its **sustainability profile.** This profile can be presented with a histogram or a spider diagram, as the following examples show." [Outrequin et al. 2003, p.27]

Figure 3 – Sustainability profile for a neighbourhood, example for a neighbourhood Target
analysis – Histogram presentation
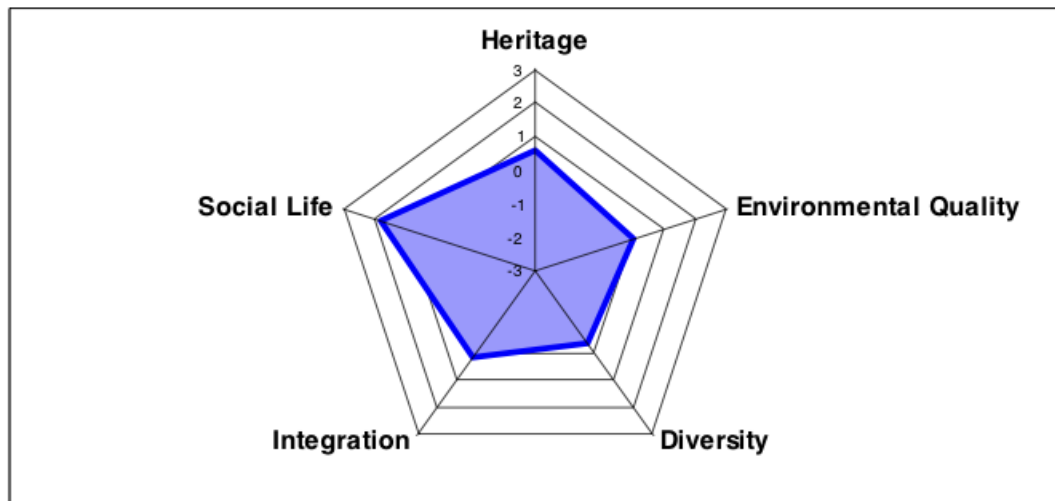

Source : La Calade

Figure 4 – Sustainability profile for a neighbourhood, example for a neighbourhood
Target analysis – Spider web presentation
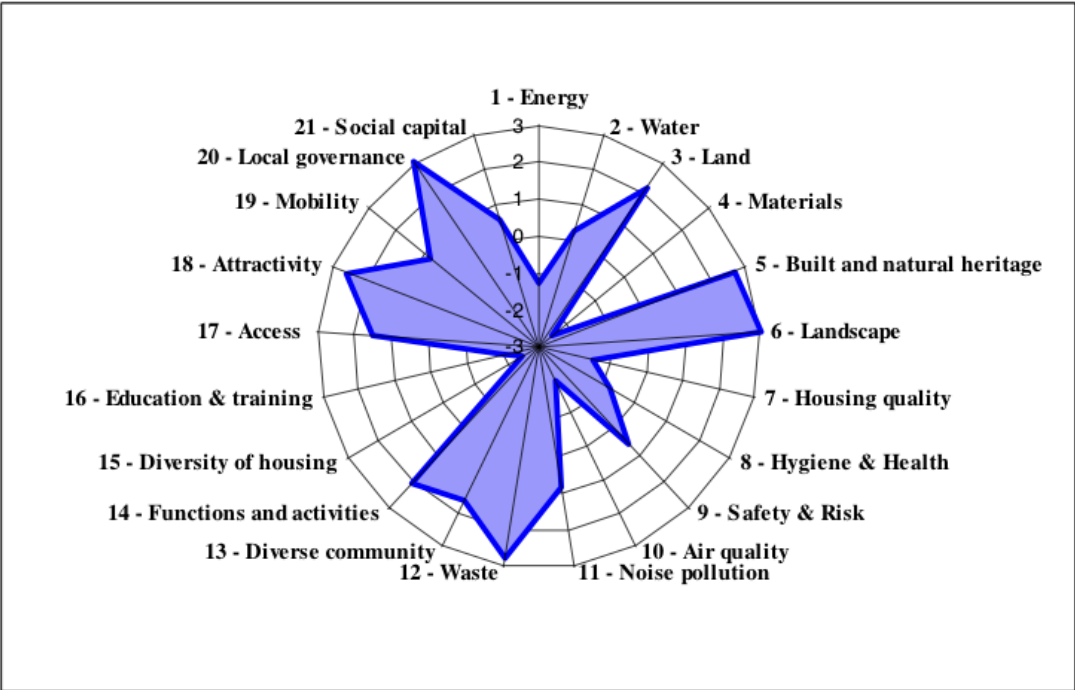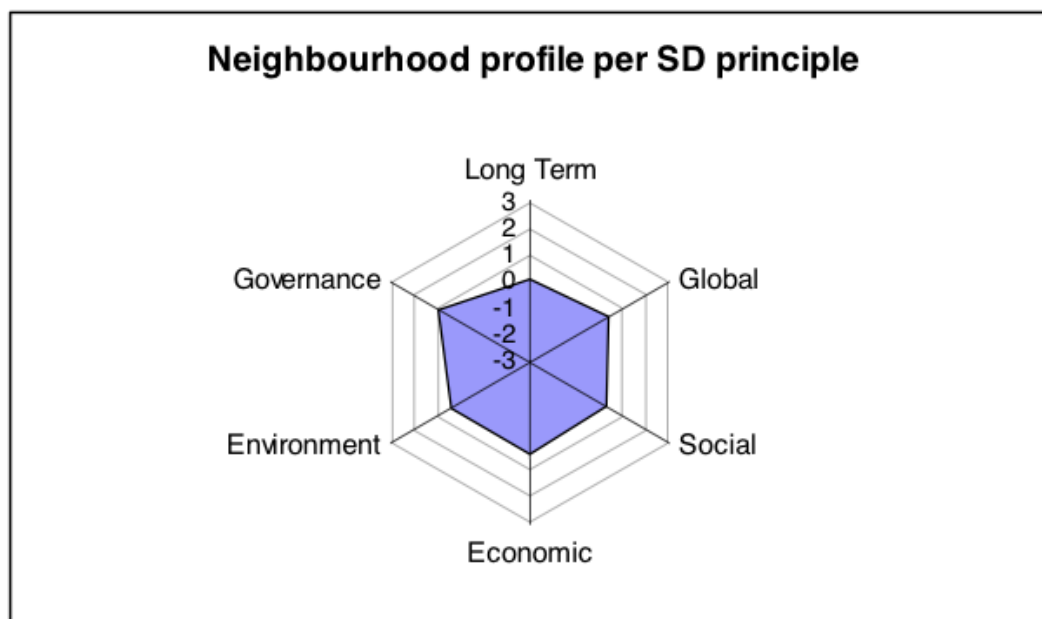

Source : La Calade

"The neighbourhood profile can also be presented for aggregate points of view : aggregation of targets per SD objective and / or SD principles." [Outrequin et al. 2003, p.29]

Figure 6 : Sustainability profile of a neighbourhood : SD Objectives analysis

Source : Catherine Charlot-Valdieu (CSTB) and Philippe Outrequin, La Calade

Figure 7 : Assessment of neighbourhood according to the SD Principles

Source : La Calade

"The model objective is to make possible the comparison of scenarios or projects. The model is only a tool to support the decision among others and it does not aim at classifying projects or scenarios in a definitive way.
We wish that this model makes everyone thinks about complementary options of the different projects and also about the deficiencies of parts of projects.
The comparison between different projects can be done through the presentation of profiles which show the impact of the projects on each target then on each SD objective.

{…}
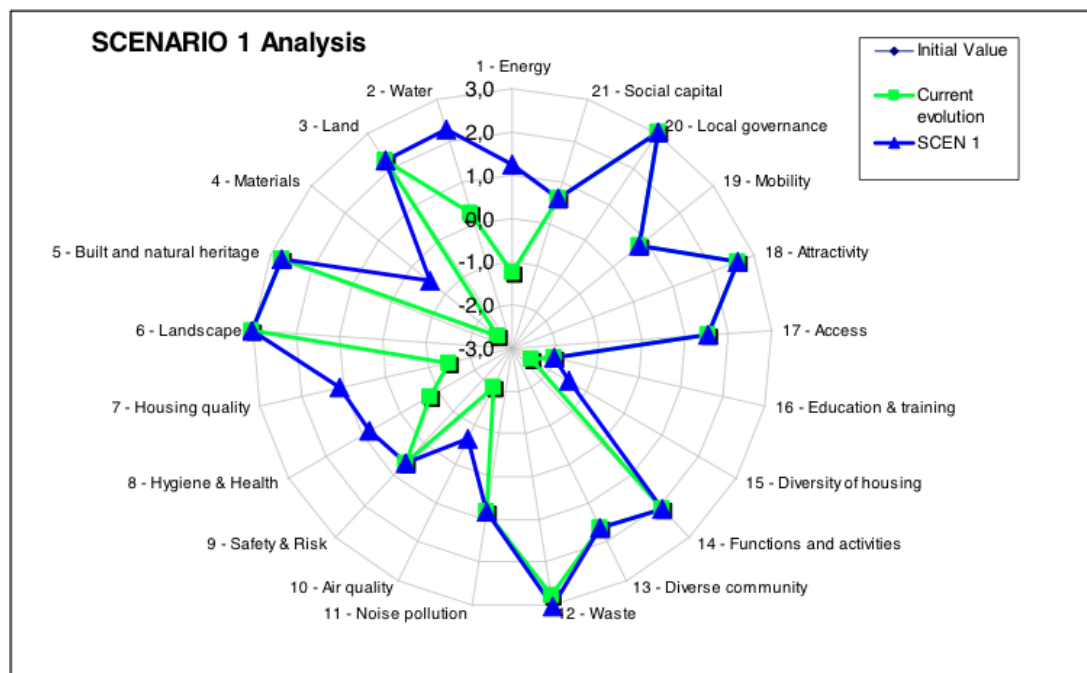The model assesses the evolution of the neighbourhood by two steps :
-   the first is to consider the neighbourhood evolution if nothing is done during the studied period
-   the second consists to elaborate scenarios and to translate these scenarios in terms of evolution of each of the model indicators.

The analysis of the evolutions of the neighbourhood is a qualitative one. Indeed, it would be very difficult and in any case very expansive to provide a quantitative assessment of the evolution of the different indicators.

The model proposes to give a qualitative assessment of the evolution of the indicators. This evolution intervenes on the sustainability scale by a modification of the value
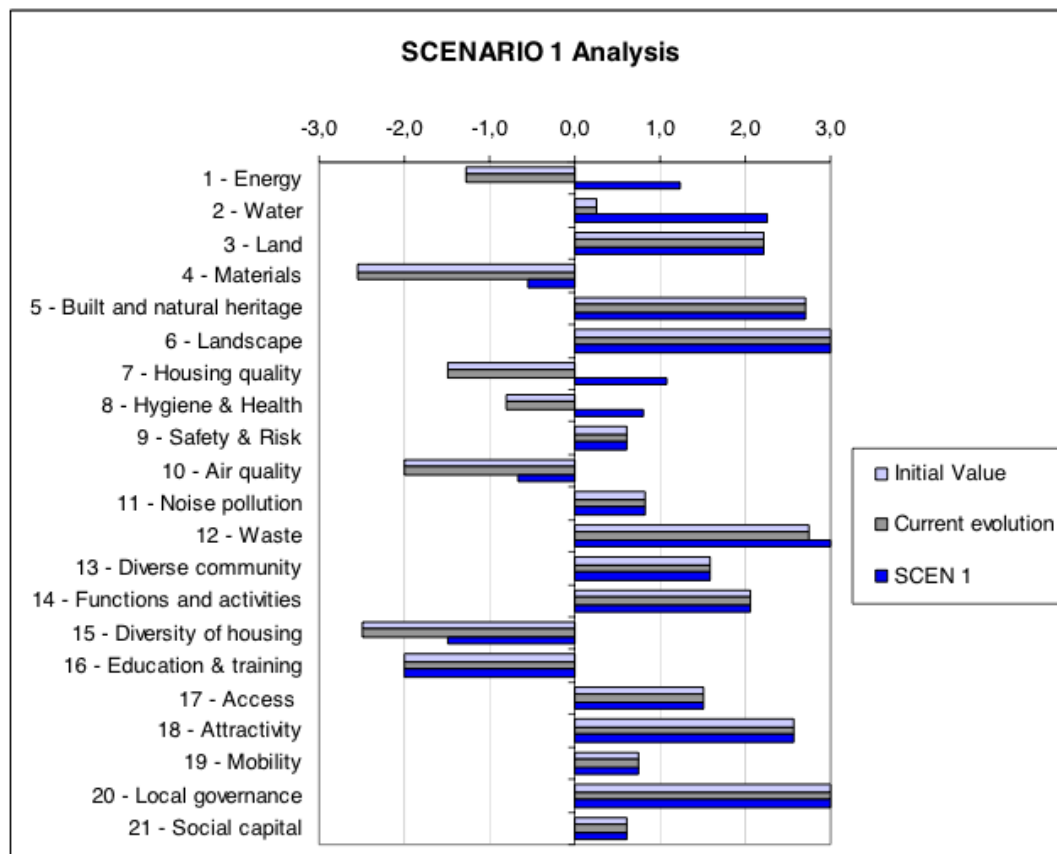" [Outrequin et al. 2003, p.30-31]

Figure 8 – Evolution of the sustainability profile

Source : Catherine Charlot-Valdieu (CSTB) and Philippe Outrequin, La Calade

SUD evaluation tools review – HQE2R

Figure 9 – Histogram presentation of the evolution of a neighbourhood

Source : Catherine Charlot-Valdieu (CST) and Philippe Outrequin, La Calade

Jorge Gil – 05/05/2010   10

HQE2R (ISDIS system and INDI model) – Tool Review

Comments on the tool regarding the various assessment criteria.

General

Background
Very comprehensive survey of existing (at the time) sud indicators in policy in Europe at the basis of the indicators list, gives some credibility.

Application (Scale and Design Phase)
Not applied beyond the case studies. The usual academic/research initiative that makes something as proof of concept.

Sustainability Principles
Well founded in accepted principles in a holistic structure. Tries to be organised and clear in the structure going down from sud dimensions to indicators. However this tidiness might not be so obvious as there are clear overlaps and synergies between issues.

Assessment Criteria

Indicators and Calculation Methods
Supports the use of benchmark values, taken from the context.

Output
The output is basic and typical. Offers two levels of aggregation, at issue and dimension. Spider graphs and histograms are good for profiling. It supports a certain level of aggregation for clarity of communicating the output. Doesn't support the quantitative summing into a rating as options are not so easily and definitively comparable.