Kopatz zeigt, wohin sich eine moderne Gesellschaft bewegen muss, wenn sie Nachhaltigkeit als selbstverständliche Routine etablieren möchte.“

Harald Welzer (Vorwort)

Damit Geräte weniger oft kaputtgehen, Tierhaltung artgerechter wird oder Zusatzstoffe aus Lebensmitteln verschwinden, brauchen wir neue Standards und Limits. Das Buch enthält eine Vielzahl konkreter Ideen, eine To-do-List für Politiker, Wirtschaft und Bürger.

Michael Kopatz
Ökoroutine

Damit wir tun, was wir für richtig halten

ISBN: 978-3-86581-820-1
344 Seiten, 39,95 Euro

Erhältlich im Buchhandel oder bei www.oekom.de, oekom@verlegerdienst.de
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The td-award is financially supported by STIFTUNG MERCATOR SCHWEIZ

Transdisciplinarity, still a young field, thrives on innovations. Researchers and research funders need encouragement to contribute to the maturaton of the field. To this end, the 2015 ta-award showcased six exemplary transdisciplinary projects which are featured in this GAIA special.

ECONOMIC VALUATION OF ECOSYSTEM SERVICES

What are ecosystems worth? Can the destruction of one habitat be compensated for by the conservation of an equivalent one elsewhere? Capturing the economic value of ecosystems and their services in decision making seems to be a promising approach, but only if instruments are designed properly.
Exemplary Transdisciplinary Projects – swiss-academies award for transdisciplinary research 2015

During the most recent International Transdisciplinary Conference, from 8 to 10 September 2015 in Basel, Switzerland, the swiss-academies award for transdisciplinary research was presented to innovative projects in Switzerland (see figure 1). Included were the main research award, young career awards and an award for life-time achievement. Mercator Foundation Switzerland supports the Swiss Academies of Arts and Sciences to promote transdisciplinary research. In total, 75,000 Swiss francs were awarded to the 2015 winners.

Intense Competition for the Main Prize

The 2015 transdisciplinary award was won by architect Emmanuel Rey and his team from the Federal Institute of Technology in Lausanne (EPFL). Architecture is not often considered as a science per se. However, with its foundation in geometry, mathematics, physics, chemistry, social science and philosophy being well established, architecture can be considered as a meta-science which reaches beyond pure knowledge to connect with esthetics and the prevailing “Zeitgeist”. As one of the most ancient cultural expressions of humanity, architecture implies a societal engagement of architects, engineers and builders. In current times, there is more than ever a need for innovative, sustainable urban planning. In this sense, architecture is a key field of transdisciplinarity, engaging academic and nonacademic actors as part of the research process for societal problem solving.

You will read in this issue of GAIA how the team of Emmanuel Rey engaged in a scenario process with sixty students and integrated authorities and other stakeholders in order to explore urban densification issues. They elaborated six urban and architectural visions, using a multi-criteria catalogue of social, ecological and economic criteria, in order to optimise all of these barely comparable dimensions.

This project shows the strength of transdisciplinarity because it ultimately relates interdiscipline science with a societal perspective, extending a purely academic point of view. The developed method was applied to other community projects, and the Jury expects that building projects and urban planning will enter a new era of integrated transdisciplinary development aimed at an optimal technical and societal consensus. To cite Emmanuel Rey: “Ultimately, synthesising multiple constraints into a unifying spatial concept has always been an essential element of an architectural or urban project. Therefore, from our viewpoint, transdisciplinarity is by no means revolutionising the foundation of architecture or urbanism. Rather, it makes it possible to enrich...”

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http://dx.doi.org/10.14512/gaia.25.3.9
practices and research in these two fields with new inputs, on the environmental, sociocultural or economic levels. In order to tackle the complexity and the multiplicity of these parameters, architects are definitely expected to master transdisciplinarity if they are to assume their role of central coordinator of the project”.

Future generations of architects and urban planners should profit from this new approach of “jointly designing for urban sustainability”. td-net expects strong leadership in training and education in the sense of a transdisciplinary perspective.

Two additional research teams were nominated for outstanding achievements in transdisciplinary practice.

In the framework of the National Research Programme Sustainable Water Management (NRP 61), Rolf Weingartner and the team from the University of Bern investigated the options for sustainable water management strategies to cope with future possibility of water scarcity in the region Crans-Montana-Sierre, Canton of Valais, Switzerland (see box 1, p. 184).

This team, uniting members from the universities of Bern, Fribourg, and Lausanne, engaged stakeholders from communities, local authorities and scientists, in an exemplary way. Weingartner explained in the application the “co-production of knowledge as a process in which scientists, experts and other nonacademic actors co-construct systems, target and transformation knowledge with a view to finding solutions to concrete lifeworld problems related to sustainable development”. Moreover, he emphasised that “nonacademic knowledge is systematically integrated by continuously encouraging dialogue between different actors”.

Certainly the inclusion of nonacademic knowledge is critical for finding acceptable solutions within a given context. This remains true even when communities insist on autonomy and the solutions which are acceptable from a societal perspective are not those which seem optimal from an academic point of view.

The Jury also recognised Kai M. Udert from the Swiss Federal Institute of Aquatic Science and Technology (eawag) with a token of appreciation. He led a research partnership between South African and Swiss teams on the recycling of human urine as crop fertilizer. The work was composed of a technical and a societal component showing that technological development in recycling of nutrients alone is not sufficient but needs to be embedded into a societal process of socially and culturally acceptable practices. Their transdisciplinary approach and project guidelines are also described in this issue of GAIA.

Promising Young Academics

Over the years, td-net became more and more aware that distinguished achievements were generally awarded to senior researchers. Most of the awards were granted to quite encompassing research programmes, which spanned several years to include a large number of subprojects from different disciplines. It is understandable that excelling in such programmes necessitates considerable experience and seniority.

On the other hand, transdisciplinarity is still a young field, which needs innovative ideas and fresh perspectives. Young people should gain visibility, as they develop new ideas that may not immediately result in expansive, integrated programmes.

With the award for early career achievement, Emmanuel Rey, Sophie Lufjør: GREEN DENSITY. A Transdisciplinary Research and Teaching Project for the Design of Sustainable Neighbourhoods  ▶ p. 185

Flurina Schneider, Manon Bonponsor, Olivier Gaeji, Karl Herweg, Christine Homewood, Matthias Huss, Martina Kauzlanic, Hampeter Liniger, Emmanuel Rey, Emmanuel Reynard, Stephan Rist, Bruno Schädler, Rolf Weingartner: MontanAqua: Tackling Water Stress in the Alps. Water Management Options in the Crans-Montana-Sierre Region (Valais)  ▶ p. 191

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FIGURE 1: td-award 2015 award ceremony in Basel (from left to right): Therese Paulsen, Bernhard Truffer, Jakob Zinsstag (jury members), Sabine Hoffmann (awardee), Guy Morin (laudation, President of the Executive Council of the Canton of Basel-Stadt), Marcel Tanner (awardees), Pasqualina Perrig-Chiello (jury), Emmanuel Rey, Kaspar Burger (awardees), Kai M. Udert, Flurina Schneider for Rolf Weingartner (shortlisted projects).
The Canton of Valais is situated between two alpine mountain chains which divert rain so that irrigation is required for agricultural production. Dealing with water resources is a century-old community-based activity because the water has to be collected from glacier sources into canals, made from dug-out logs set along steep cliffs, to provide it to meadows and grain fields in the mountain villages. Many men died during these building operations; therefore, the irrigation system is also called the “Holy Waters”. Not surprisingly, Elinor Ostrom started her research work in Valais, specifically in Törbel, studying the community dynamics and economics of decentralised natural resource management for which she later won the Nobel Prize in Economics.

BOX 1: The “Holy Waters” in the Canton of Valais

<table>
<thead>
<tr>
<th>Kaspar Burger:</th>
<th>A Transdisciplinary Approach to Research on Early Childhood Education</th>
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</tr>
</tbody>
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For this, he leveraged theories and methods from educational sciences, psychology and sociology as well as linguistics and literature studies. The Jury viewed this study as an exemplary way for conducting transdisciplinary research in the realm of social sciences.

Sabine Hoffmann is awarded for her project Knowledge Integration for Sustainable Urban Water Management. She analysed the five overarching synthesis processes in the context of the National Research Programme Sustainable Water Management (NRP 61). She identified the different methods for knowledge integration in transdisciplinary research in these various processes and assessed their strengths and weaknesses. In addition, she provided a useful entry point for young scholars entering the transdisciplinary field and, therefore, contributes to further professionalise the management of td projects. The award committee considered this to be one of the key challenges for building up transdisciplinary competence in the Swiss academic field.

Honouring Personal Commitment

Personalities who have dedicated their professional career to establish interdisciplinary and transdisciplinary research are important role models in the scientific community. The td-net life-time award recognises long-lasting personal commitment to transdisciplinary research. It honours outstanding scientists who step out of the laboratory, engage perspectives of various disciplines and include nonacademic players in the research process.

“We need to have dirt on our shoes”. This is the motto of Marcel Tanner, former director of the Swiss Tropical and Public Health Institute (Swiss TPH). It is difficult to summarise the very rich vitae and his outstanding achievements in a few lines. He is a personality who has always been committed to reform of the academic system. As head of the Swiss TPH, he helped the institution to gain international acclaim. He not only promoted a culture of interdisciplinarity at his institute, but was also one of the first to combine cutting-edge disciplinary research with inter- and transdisciplinary approaches and initiate new research projects in various regions of the world in close contact with the local populations. With his international engagement in global research partnerships, he gave transdisciplinary research a new dimension of “mutual learning for change”. He promoted intercultural exchange among experts in various, equally valuable knowledge systems, helping to create great added value through mutual learning, in order to better meet the challenges associated with global change.

A Glance into the Future

The strengthening of transdisciplinary research approaches will continue to require commitment in funding, and td-net contributes by promoting appropriate funding policies. This is well documented by the Swiss National Science Foundation’s National Research Programmes and research for development (r4d) funding lines. Switzerland, although a small country with a limited research community, is active in transdisciplinary research at an internationally outstanding level. To avoid repetition and loss of excellence, the td-net of the Swiss Academies are considering development of the award into a new motivation for scientists to perform transdisciplinary research with methodological excellence. td-net continues to seek solutions to close gaps in academic careers. Our explicit aim is to further develop new theoretical foundations and methods and to promote transdisciplinary research in various fields. This will strengthen the scientific base and the excellence of future approaches of research for societal problem solving.

td-net aims to strengthen the position and expertise of the transdisciplinary community – in one way or another, we will find new ways to showcase innovative projects, thoughts and approaches and provide the community with trend setting role models.
GREEN DENSITY
A Transdisciplinary Research and Teaching Project for the Design of Sustainable Neighbourhoods

The GREEN DENSITY transdisciplinary research and teaching project focuses on the Waldstadt sector, a strip of forest bordering the city of Bern. This strategic site, likely to host new inhabitants and jobs close to public transport, is particularly adapted to explore urban densification issues. The objective is to experiment, compare and evaluate diverse possible urban forms for the development of such a site.

The process includes the elaboration of six urban and architectural visions from students’ projects developed within Rey’s studio at Ecole polytechnique fédérale de Lausanne (EPFL) and their transdisciplinary multi-criteria assessment.

Emmanuel Rey, Sophie Lufkin

To achieve a more efficient use of resources and to strengthen the attractiveness of future urban territories, inventing appropriate design strategies to reclaim urban spaces has become a top priority (Rey and Lufkin 2015). As a genuine tool for exploring spatial, typological and technical alternatives, the architectural and urban design is called to play an essential role and is likely to promote the evolution of the built environment towards increased sustainability (Rey 2014). The inherent holistic nature of sustainability, based on the simultaneous and optimal consideration of a wide range of environmental, sociocultural and economic parameters, induces an increased complexity, which enforces the need to develop new transdisciplinary approaches, both in the architectural practice and in the built environment academic world.

The GREEN DENSITY transdisciplinary research and teaching project provides an innovative framing of these complex issues. It aims to design, optimise and assess urban and architectural visions by exploring novel ways to integrate transdisciplinary and evaluative approaches into the project’s process. This paper presents an application of the GREEN DENSITY experience to six original visions developed for Waldstadt sector. Located in close proximity to the city centre of Bern (Switzerland), this emblematic site is particularly adapted to explore urban densification strategies aiming at increasing inhabitants’ global quality of life in a holistic sustainability perspective.

Need for Innovative Transdisciplinary Approaches

Indeed, in a context of reconsideration of urban sprawl, there is a certain consensus on the necessity to promote densification processes in European urban territories (Newman and Kenworthy 1999, Williams et al. 2000). Sites such as Waldstadt sector, likely to host new inhabitants and jobs close to public transport, are becoming highly strategic to promote qualitative densification processes. Their development can potentially allow for the construction of new dense and mixed neighbourhoods (Rogers 1998), which fit in with broader sustainability perspectives targeting more efficient use of resources and increasing attractiveness of the entire urban region.

These sustainability perspectives involve finding a long-term balance between environmental, sociocultural and economic objectives. On an operational level, the main challenge is to imagine concrete actions that foster the simultaneous emergence of positive effects in more than one of these dimensions. Regarding the urban and architectural design, it is a question of implementing coherent strategies that are technically appropriate, environmentally friendly, economically viable and value-adding on a sociocultural level (Rey 2012).

The complex and significant scope induced by this holistic approach involves integrating an increased number of competencies into the architectural and urban project’s process, which consequently translates into implementing and coordinating transdisciplinary collaborations (Darbellay and Paulsen 2008). In a sustaina...
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ability perspective, the latter are not limited to traditional practices of technical coordination. Indeed, current design practices are characterised by a certain disconnection between the design process, conducted by the architect, and the specialised inputs, realised by engineers and specialists. Knowledge and know-how thus tend to remain parallel and partitioned. Iterations between disciplines are few, and most responses are limited to minimal coordination, which fails to truly nourish the design process. However, the significance and the complexity of the issues encourage built environment practitioners and researchers to explore new avenues for cooperation, according to the specific issues raised by each project (Rey 2015a).

Our transdisciplinary approach goes beyond a simple addition of sectorial logics: it aims to transcend disciplinary boundaries to integrate diverse inputs into a common spatial strategy. The project’s process can thus be nourished by considerations from disciplines other than urban planning and architecture, without ignoring spatial coherence and adapted expression of the final realisation. This suggests increased communication between the various involved stakeholders and intense coordination between their respective areas of expertise. Therefore, to support the dialogue between experts from different fields and nonprofessional actors from the civil society, it is essential to develop simple, efficient and synthetic visual methods to represent the current complexity of transformation processes in urban contexts at all stages of the project: design, realisation, operation and monitoring.

In reaction, built environment researchers and practitioners are currently developing a wide range of transdisciplinary sustainability assessment tools to aid decision-making at neighbourhood scale. Generic examples include the One Planet Living and its ten principles (Bioregional 2015), stemming from Bioregional’s experience of working on the eco-village of BedZED, UK, or the SPeAR® methodology (Sustainable Project Appraisal Routine), developed by Arup (2012), which appraises urban projects based on key themes such as transport, biodiversity, culture, employment and skills. More specific approaches can also be mentioned, such as the SIPRIUS tool, an indicator system for the integration of sustainability into the design process of urban disused areas (Laprise et al. 2015) or the URBIUS tool, a multi-criteria decision support methodology for urban renewal strategies at neighbourhood scale (Gracia Riera Pérez and Rey 2012).

In parallel to these efforts towards the integration of transdisciplinary evaluative approaches into the urban and architectural project’s process, innovative education methods also have to be developed to make future architects aware of the multiplicity of environmental, sociocultural and economic parameters (Roulet 2006). This is precisely the focus of the GREEN DENSITY project (Rey and Lufkin 2014, Rey 2013), which aims to design, optimise and assess urban and architectural projects while enriching the education of future architects.

Development of Six Visions for the Waldstadt Sector

The first application of the GREEN DENSITY approach was carried out on the Waldstadt sector, a strip of forest bordering the city of Bern and separated from the Bremgarten forest by a highway. Given the high demographic growth of the Bern urban region, this strategic sector, which measures 46 hectares, is likely to attract several thousand new inhabitants and jobs in close proximity to public transport and a well-preserved natural landscape (Kaufmann et al. 2000).

The project’s methodology includes four major steps. The first one was achieved within the framework of Rey’s architectural design studio at Ecole polytechnique fédérale de Lausanne (EPFL) in 2010/2011 and 2011/2012. The remarkable commitment of students and assistants, as well as the valuable contribution of external lecturers, allowed for production of approximately 60 projects, from urban form to constructive detail. Confronting the students with representatives from disciplines related to architectural design during their learning process allowed for simultaneous integration of architecture and sustainability issues.

The second phase took the form of two summer workshops, organised in 2011 and 2012. Guided by the studio assistants, a doz-
Emmanuel Rey, Sophie Lufkin

motivated students developed and improved the most promising projects. The results from four design studio semesters were thus optimised and radicalised to elaborate six synthetic visions, respectively titled Transition, Interface, Outposts, Checkerboard, Continuities and Hyperdensities (figure 1).

The Transition project involves the development of a series of medium-sized buildings and systems at the domestic scale. Private balconies, shared terraces (for use by two dwellings) and neutral, sunny designs with open views onto the forest target households of all kinds of people in search of calm, tranquil and secure housing in the heart of the forest.

Interface promotes conviviality and social exchange through its system of passageways, community rooms and collective terraces on each floor, and series of three-sided interior courtyards. These courtyards are easily used, as are the upper floors, with wide-open spaces that are conducive to family life and children’s games.

The Outposts project features more anonymous buildings. Their large size gives them an imposing character, and their layout leaves little possibility for use of outdoor spaces. This project is adapted to singles or couples seeking luxury apartments overlooking the forest, with a guarantee of anonymity.

Checkerboard and Continuities are projects with a maximum of six floors (figure 2). The closed or semi-open island design supports intense neighbourly relations, where exchanges can take place in both the outdoor spaces and the passageways. The projects also allow residents to enjoy their privacy, thanks to private balconies. The inner courtyards can easily be used as play areas or urban vegetable gardens.

Hyperdensities is a very compact project that is strongly geared to households who want to experience a sense of “urbanity”, where one can observe or bump into one’s neighbours without necessarily having exchanges with them. The outdoor areas are very open and only partially connected to the dwellings. The project is more suited to single people or couples without children, who are seeking to live in a lively, trendy urban environment.

Multi-criteria Assessment of the Visions

Subsequently, the third phase consisted of the thematic analysis of the visions. Several experts from diverse disciplinary backgrounds, based at the School of Architecture, Civil and Environmental Engineering (ENAC) of EPFL, were invited to take a critical look at the visions. Their contributions highlight various environmental, energetic, sociological or economic aspects. Thanks to a coordinated work between architecture teachers and different specialists, it was possible to gain some perspective – enriched by manifold dimensions – on the different urban visions. In addition, the organisation of a series of iterative meetings made pos-
sible the emergence of a common language, which continues to
enrich exchanges between all GREEN DENSITY project contrib-
utors.

The last phase was dedicated to the transdisciplinary multi-
criteria assessment of the six visions. As previously mentioned,
the creation of a sustainable neighbourhood involves searching
for global quality and therefore taking into consideration a broad
number of environmental, economic and sociocultural para-
ters, which requires transdisciplinary evaluation.

The assessment methodology is built around five main cate-
gories (as shown in Table 1, each category includes two relevant
indicators):
1. density and mix,
2. energy gains and losses,
3. biodiversity and water,
4. lifestyles,
5. economic return.

Ultimately, a synthetic representation is realised (Figure 3): the
ten thematic indicators are grouped in a radar diagram, revealing
the sustainability profile of each vision. These diagrams enable the
direct, graphical multi-criteria evaluation and comparison of the
six visions. For each of the ten indicators, the centre of the radar
diagram is equivalent to the minimum value while the end of the
axis corresponds to the maximum value.

**Table 1:** Transdisciplinary multi-criteria assessment. Five categories, as well
as their respective indicators, are used to evaluate environmental, economic
and sociocultural parameters of the six urban densification visions of the
Waldstadt sector.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>INDICATOR 1</th>
<th>INDICATOR 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>density and mix</td>
<td>land use index</td>
<td>functional mix</td>
</tr>
<tr>
<td>energy gains and losses</td>
<td>compactness</td>
<td>solar potential</td>
</tr>
<tr>
<td>biodiversity and water</td>
<td>preserved forest</td>
<td>permeable soil</td>
</tr>
<tr>
<td>lifestyles</td>
<td>level of conviviality</td>
<td>family friendliness</td>
</tr>
<tr>
<td>economic return</td>
<td>profit</td>
<td>profitability</td>
</tr>
</tbody>
</table>

Transdisciplinary approaches, both quantitative and qualitative, are crucial to fully
grasp the inherent complexity of urban densification processes.

This graphical representation emphasises the strong hetero-
genesis of the visions, highlighting their respective assets and lim-
itations. It also uncovers several interesting tendencies – in rela-
tive terms – among the different projects. Two distinct groups of
projects can thus be identified.

The first group consists of projects with a radical profile, which
tend to privilege one dimension of sustainability at the expense of
others. The Transition, Interface and Outposts projects, for exam-
ple, systematically emphasise environmental or energy-related as-
pects. Indicators such as solar potential, preserved forest and perme-
able soil receive favourable evaluations. On the flip side, the den-
sity of these three visions is relatively low, which explains why
they remain clearly below the theoretical profitability threshold.

By contrast, the very radical Hyperdensities project, as its name
suggests, presents an increased land use index, and therefore bet-
ter economic performances (profit and profitability indicators) as
the previously cited visions. Its environmental evaluation, logi-
cally, is significantly less favourable, in particular in terms of
permeable soil and preserved forest.

Furthermore, it is interesting to note that even the most dense
vision, Hyperdensities (land use index = 2.8), remains almost two
times less dense than the historical centre of Bern (land use in-
dex = 4.7). This observation is useful to put in perspective sever-
al stereotypes about density and highlights the need for sound
evaluation methods to assess architectural projects, both quanti-
atively and qualitatively.

The second group of projects is composed of visions with a
more balanced profile, which reconcile different aspects of sus-
tainability in a holistic optimisation process. The Checkerboard and
Continuities projects, even if they are not characterised by top per-
formances, receive good evaluations for an important amount of
indicators.

**Global Quality through Transdisciplinary Strategies**

As illustrated by the Waldstadt case study, the creation of a sustain-
able neighborhood involves a search for global quality by imple-
menting transdisciplinary strategies that are technically adapted,
environmentally friendly, economically viable and which create
added value at the sociocultural level. Synthesising multiple con-
straints into a unifying spatial concept has always been an essen-
tial element of an architectural or urban project. Therefore, from
our viewpoint, transdisciplinarity is by no means revolutionising
the foundation of architecture or urbanism. Rather, it makes it pos-
sible to enrich practices and research in these two fields with new

inputs, on environmental, sociocultural or economic levels. In or-
der to tackle the complexity and the multiplicity of these parame-
ters, architects are definitely expected to master transdisciplinari-
it if they are to assume the role of central coordinator of the project.

Transdisciplinary approaches, both quantitative and qualitative,
are crucial to fully grasp the inherent complexity of urban densi-
fication processes. By its effectiveness and clarity, the transdisci-
plinary evaluative approach developed within the framework of
the GREEN DENSITY project provides a powerful critical analysis,
decision-making and communication tool. Going beyond traditional educational methods, which maintain the gap between architects and experts from other fields, it explores innovative ways to integrate holistic, transdisciplinary and evaluative approaches in urban and architectural project teaching. By strengthening the links between the often separate worlds of education and research, it heightens the awareness and enriches the education of future architects.

To make sure that the results of the GREEN DENSITY experience found their way into society at large, a book was published in the Architecture Album collection of the Presses polytechniques et universitaires romandes (PPUR). Entitled Green Density, it presents each vision in a specific sequence with numerous colour illustrations (plans, sections, model photographs, 3D visualisations). Texts presenting the thematic insights are intertwined with the six visions. To valorise the outcomes of the GREEN DENSITY project and to increase its societal impact, a public exhibition was also organised from 22nd November to 8th December 2013 at the Forum d’architectures de Lausanne. The opening of the exhibit, which took place on November 19th, included short speeches by Marilyne Andersen, Dean of the ENAC School, Luca Ortelli, Head of the Institute of Architecture and the City (IA), and Emmanuel Rey, Head of the Laboratory of Architecture and Sustainable Technologies (LAST).

Ultimately, in order to apply the GREEN DENSITY experience to other case studies, a methodology named Neighbourhood-scale Evaluation to Benchmark the Integration of Urban Sustainability (NEBIUS) was developed. As an extension of the GREEN DENSITY approach, this methodology represents a baseline from which other sustainable neighbourhoods, located in other urban areas, can be compared and assessed, whether in academic or operational contexts. Other application case studies proving the value of the approach have already been carried out in Yverdon-les-Bains, Canton of Vaud (Rey 2015 b), and are currently being conducted in West Lausanne (Rey forthcoming).

1 www.archi-far.ch
The authors would like to thank the td-net award committee for the recognition of their work, which confirms the viability of the approach and validates the relevance of the experience conducted over a four-year period, from architectural design studio to multi-criteria assessment, including summer workshops and thematic analyses by experts. They also express their gratitude to the Ecole polytechnique fédérale de Lausanne, which has provided an appropriate framework for the development of the GREEN DENSITY research and teaching project, as well as to all researchers, lecturers and students who contributed to this innovative transdisciplinary experience.

References


Submitted May 27, 2016; revised version accepted July 26, 2016.

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Sophie Lufkin

Born 1980 in Geneva, Switzerland. 2005 MA architecture, 2010 PhD. Currently working as a scientist and lecturer at the Laboratory of Architecture and Sustainable Technologies (LAST) at Ecole polytechnique fédérale de Lausanne (EPFL). Research interests: densification potential of disused railway areas, sustainable and symbiotic neighbourhoods, which follow basic industrial ecology principles to increase exchanges and synergies at neighbourhood scale.