

World café method to engage smart energy-district project partners in assessing urban co-benefits

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Abstract

Urban energy-district projects introduce outstanding technological innovation in buildings and energy systems increasing sustainability in city neighborhoods. Such projects generate additional co-benefits for the city beyond changes in physical elements and development of social and institutional relationships (e.g. local employment, environmental quality, public health, property values, innovation attitude, etc.). Since exceeding main declared goals or not always clearly foreseen in the early project phase, these co-benefits are often not properly understood and considered. However, only their explicit recognition will make possible their inclusion in the assessment of the whole project's performance.

From these considerations, this study faces the issue of engaging project partners in assessing co-benefits in order to consider a broad spectrum of relevant, positive effects in the evaluation process. Group knowledge and group thinking of this complex topic are investigated through the world café method, providing an atmosphere of trust and open discussions among participants. This empirical work lays the foundations to go beyond the mere economic measure as the sole criterion for assessing project effects, also including changes in end-user behavior and intangible assets.

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1 Introduction

Co-benefits are positive outcomes of a project or policy, both intentionally or not, exceeding the main goal (Ürge-Vorsatz et al., 2014; Mayrhofer and Gupta, 2016). The concept entered in the environmental policies rhetoric in the '90, trying to balance long-term, global and less attractive climate targets with short-term, local and more tangible benefits, to increase the commitment and acceptance toward them (Bell et al., 2008; Mayrhofer and Gupta, 2016).

In practice, regardless of the locution used (co-impacts, externalities, co-benefits, etc.) the questions around what sort of difference and how much of a difference we are making with a certain project are the same (Nicholls et al., 2012). In climate-energy projects the same outcome can be positively interpreted as a co-benefit or on the contrary as a rebound effect, depending on project scale, related stakeholders, time and interlinkages (Ürge-Vorsatz et al., 2016). Setting a common reference scale, approach and shared co-benefits list is, therefore, crucial to building up any project assessment tool, ranging from cost-benefit analysis to multi-criteria evaluations, and developing a rational decision-making process (Bisello et al., 2017b). Many studies on climate-energy policies and projects face the issue of identification, measurement, and evaluation of co-benefits related to a particular sector (e.g. environment, human health, economy), while harder to find are comprehensive studies (see for instance US EPA, 2011; Copenhagen Economics, 2012; IEA, 2014).

The need for a deeper consideration of socio-economic and environmental effects, going beyond the solely accounting for CO₂ emissions reduction and energy saving achieved by urban energy-district projects has been long recognized (Di Nucci and Spitzbart, 2010). In particular, Di Nucci and Spitzbart (2010) developed a bottom-up approach to assess them, involving the project coordinators and international experts in a workshop series. They came out with a core set of eight criteria sorted by the three sustainable development dimensions: social, economic and environmental. Discussing project results, they argue that because in most cases this *“is a subjective issue determined by individuals’ perceptions, it is advisable to attempt to measure quality of life by using indicators appraising the environment in which people live, documenting the way they perceive it and their understanding and expectations”* (Di Nucci and Spitzbart, 2010). In concluding the study, they also point out how a *“notable conflict between individual short-term quality of life benefits and collective longer term needs for sustainable development (...) is a key open challenge that next (...) projects and future programmes and initiatives like smart cities will have to cope with”* (Di Nucci and Spitzbart, 2010). Thus, first of all, it is crucial to raise awareness about co-benefits among project partners involved in a smart energy-district project. By making their expectations explicit and setting a common discussion platform, it will be possible to define appropriate indicators and methodologies to investigate co-benefits and to include them in the assessment

phase. In this context, a research started in 2014 (Bisello, 2017a) developed a list of 19 key urban co-benefits analyzing dozens of smart and sustainable energy-district project. The key urban co-benefits were the central issue in World Café involving partners of SINFONIA project.

2 SINFONIA: a smart energy-district project

In mid-2014 started a five-year “smart cities and communities” project, called SINFONIA, funded by the European Union under the FP7 program. The acronym stands for “Smart INitiative of cities Fully cOmmitted to iNvest In Advanced large-scaled energy solutions”. This project involves more than 30 partners representing multiple stakeholders (research centers, public institutions and service providers, energy companies, social housing agencies, and local governments) from eight different European countries. In its first stage, SINFONIA is going to develop smart measures within two pioneer cities: Bolzano in Italy and Innsbruck in Austria. There, it faces the issue of providing a deep-energy retrofit of publicly owned residential buildings, coupled with the implementation of innovative energy generation and distribution technologies at district level. Other activities are related to smart power grids, and planning the development of an innovative urban-information infrastructure (smart points and totems). Successfully implemented measures will later be adapted for replication in five selected European cities, called “early adopters”. A specific task aims to provide a clear understanding of the socio-economic aspects connected to the sustainability measures in the smart cities. Eurac research, the project partner responsible for task coordination, decided in January 2016 to approach these issues adopting the co-benefits paradigm, as developed by Bisello (2017a).

3 World Café Method

In an effort still, to hold a workshop in 1995, Brown and Isaacs introduced the World Cafe Method (WCM) as management communication tool and social work method in organizations and groups. The idea of communication similar to conversations in an informal atmosphere of cafes marks key characteristics of World Cafe approach: small sized tables, nicely decorated, comfortable and relatively free conversations about the topic at hand. Indeed, the WCM aims at connecting collective knowledge as well as trigger innovative thinking in organizations and groups, changing their approaches. At the same time, it allows for adapting the method to specific contexts and research questions.

To assess group knowledge and group thinking of complex topics, it is vital to provide an atmosphere of trust, purpose and open discussions. Such group discussions should then spark new ways of acting, thinking and communicating (Brown and Isaacs 2005; Chang and Chen 2015). Each table (6-8 people) is regarded as a small conference (Seliger 2008, 105) or dialogue that discusses the topic, introduces perspectives and solutions to problems. WCM follows few essential principles of WCM (Brown and Isaac 2007), reported in Tab.1: (i) Safe and informal space; (ii) Topic-oriented; (iii) Questions that Matter; (iv) Everybody's contribution is needed; (v) Connecting different perspectives thanks to facilitator; (vi) Bigger picture, and (vii) Collective insights. Facilitator must ensure (a) the comfort of participants in space and discussion, the focus on (b) topics and (c) questions that matter (Kühn and Koschel 2011, 142). Furthermore, the facilitator ensures that (d) everybody is heard in the discussion, to keep conversation alive, (e) statements are connected with each other, and (f) an agreement upon asked questions or tasks given is found.

1 Safe and informal space

Creating a safe and comfortable space for participants is key in the attempt of meaningful conversations. In terms of physical environment as well as invitations and discussion process, it is vital to strive for informal structures. When participants feel comfortable it sparks creative thinking, speaking and listening, which is at the heart of WCM.

2 Topic oriented

Laying down a clear goal of the discussion helps to guide the conversations and the whole inquiry. Although World Café has an informal set-up, this does not mean it is just a conversation. Keeping a clear topic is important to collect relevant data or come up with innovative ideas.

3 Questions that Matter

Interesting concepts and compelling questions attract more attention and discussion. Therefore, WCM relies on meaningful questions that help attract collective energy, knowledge, and action. Depending on the setup, WCM may explore a single question in depth or use a progressively deeper line of inquiry through several rounds.

4 Everybody's contribution is needed

In every discussion, more dominant and secure participants take up more speaking time. In a World Café, it is the role of each table moderator to make sure that everybody's voice and ideas are heard. A discussion that enables participants to contribute is key for enlightening new ideas and group dynamics.

5 Connecting different perspectives

Moving between tables enables participants to meet new people, learn new perspectives, link new insights and present new ideas to widening circles of thought. As one of WCM's major features, this provides for the opportunity to exchange perspectives and spark new ideas for the problem or question at hand.

6 Bigger picture

Listening to different perspectives and putting emerging patterns together helps to see a bigger picture collectively. Through practicing shared listening and paying attention to themes and insights, a sense of connection can be established. Presentation, reflection and discussion are key to this endeavor in WCM.

7 Collective Insights

Conversations held at one table reflect a pattern of wholeness that connects with the conversations at the other tables. The last, plenary phase of WCM involves making common patterns visible to everyone in a large group conversation. There should be time to reflect on patterns, themes and deeper questions discovered in the discussions, in order to call them out to share with the larger group. This step recommends preparing graphic records such as poster material.

Table 1 – Essential principles of WMC. Source: Brown and Isaac (2007).

Like with other conference-style methods e.g. Future conference, Open Space, Real-Time-Strategic-Change-Conference (RTSC), Appreciative Inquiry Summit (Seliger 2008), WCM wants to provide a less formal attempt to answering complex questions to trigger meaningful conversations within groups and organizations. Where Open Space has almost no formal rules and involves the whole group at once, WCM allows breaking down into smaller units, making it easier for each participant to contribute to conversations. Other group conference methods approach specific topics like the future of an organization (Future conference), particular challenges (Appreciative Inquiry Summit) or a common strategy towards a collective goal (RTSC). For our purpose, WCM fitted better because, although our participants already were bound by a common goal, their organizational strength is looser than in a typical company, as they work with different companies and are from different cities in Europe. WCM gave participants time to get to know each other in the beginning of the tasks. Some components of focus group were added for understanding in a targeted manner and investigating the groups' collective knowledge and insight of smart energy-district project co-benefits.

4 Practical use of WCM in other studies and adaptation to SINFONIA project

Broom, Brady, Kecskes and Kildea (2013) used WCM to access collective knowledge and experiences of neonatal staff. Their results formulated key recommendations for redesigning a new Neonatal Intensive Care Unit and sparked an important discussion among staff, exploring comprehensively what the group can contribute with their specific insights to new neonatal care and facility design. Ritch and Brennan (2010) used WCM to gather data on financial needs of seniors. Their approach used WCM as “circulating focus groups” with a theatrical play in the be-

ginning to set a frame for the topic at hand. Their findings reinforced the assumptions of relaxed conversations exploring meaningful topics in depth through shared experiences and knowledge. Participants of this study who agreed on the suitability of WCM found that it “enabled the sharing of experiences on a sensitive subject” (Ritch and Brennan 2010, 410).

In other studies, WCM is used to access dialogue patterns and understand how new interactions and insights translate into real action. Applying this, Takahashi et.al. (2014) found in their study of energy saving actions in a company, that a quantitatively more active dialogue leads to a more positive feeling about the conversations. However, more importantly, their findings indicate, that a more active and positively connoted dialogue increased real actions taken by participants afterward. Similar to our study, this inquiry understood the endeavor of energy saving action comprehensively, complex and connected. In that WCM was a way for “[...] engaging the hearts and minds of every person” (Takahashi et.al. 2014, 88) in the issue at hand. Based on these examples and the considerations reported in section 3, we decided to implement a participatory approach among project partners during the SINFONIA second annual meeting organized in June 2016 in Seville. This meeting offered the opportunity to start the “clear understanding phase” of the socio-economic aspects connected to project development.

First, a general presentation about the co-benefit concept was given to project partners, explaining those related to the seven smart city dimensions detected in European Funded projects, as reported in Box. 1. Later on, partners were asked to fill a questionnaire for ranking the co-benefits by importance individually. Once briefly presented the outline and recalled the rules of WCM, participants were organized and seated in already outlined small groups of 7-8 people with a facilitator at each table. Groups were composed in the most diverse way possible (cities and professional affiliations were mixed) to reproduce composition of partners network, gain meaningful discussions and produce new insights.

Each table had the previously presented co-benefits as cards on their table, blank cards for writing new co-benefits they could come up, and poster materials prepared for them. To establish an informal atmosphere, participants could get coffee or snacks anytime. Three questions (or tasks) were given to be developed through the WCM: (i) among those listed, what do you think are the most important co-benefits for your cities? (ii) If the co-benefit expresses itself in all its potential, what would be the situation in your city at the end of the project? (iii) Find consensus and rank the top five important co-benefits for your cities. After discussing for about one hour, stimulated and guided by the facilitators, each table created a poster which one person for each group presented to all participants at the plenary session. The whole process was audio recorded, including the final presentations.

Smart natural environment	<p>1. Local air quality improved. Shifting heat and power production from fossil fuels to renewables, and decreasing energy needs, reduces air pollutants (e.g. SOx, NOx, particulate matter), with positive effects on human health.</p> <p>2. Environmental resources management improved. Establishing a better way to manage environmental resources reduces the environmental footprint of human activities, with positive effects on ecosystems.</p>
Smart services	<p>3. Health and well-being of residents increased. Improving the indoor thermal comfort and spatial quality in dwellings increases living and psychological conditions of occupants.</p>
Smart community	<p>4. Fuel poverty tackled. Reducing energy expenses to an affordable level, even for low-income people, can lower harmful effects to health, caused by indoor thermal shocks (in summer as in winter).</p> <p>5. Users awareness on energy-related issues increased. Educational and communication activities change positively stakeholders and tenants energy behaviour and acceptance of new technologies.</p> <p>6. Neighbourhood identity enhanced. Creating new neighbourhood relationships and sense of place will lead to the formulation of dense social networks and ultimately better economic and social outcomes.</p>
Smart governance	<p>7. Innovation in processes and decision-making. The exchange of experiences introduces innovation, with a positive improvement of the quality and effectiveness of decision-making.</p> <p>8. Territorial attractiveness increased. An exemplary smart and sustainable district attracts visitors interested in innovative and green solutions (e.g. institutions, public officials, researchers or green tourists).</p> <p>9. Institutional relationship and networks created. Creating and strengthening existing relationships between partners and cities leads to further joint activities and collaboration.</p>
Smart economy	<p>10. Positive change in local tax revenue. Creating new jobs and economic activities will positively affect the local public revenues.</p> <p>11. Softer loan conditions. Large scale interventions financially supported by the European Union can be interesting for banks and other investors and therefore negotiate better financial conditions.</p> <p>12. Local labour market stimulated. New direct or indirect job positions are created from the implementation of construction activities, project management and other intervention measures.</p> <p>13. Local energy supply chain established. Developing new energy supply chain using local renewable sources or by-products (e.g. waste-to-energy, bio-energy) generate additional revenues.</p> <p>14. Energy services developed. Developing innovative energy schemes allow us to cover refurbishment intervention costs without additional expenses for tenants or owners.</p> <p>15. Innovation in technology development and adoption. Companies involved in the project will be frontrunners in the adoption of innovative solutions and therefore have an advantage over their competitors on the market.</p> <p>16. Professional skills development. An increase in knowledge and know-how of professionals and practitioner on innovative processes and energy technologies augment productivity and competitiveness.</p>
Smart built environment	<p>17. Property value increased. Green (new and retrofitted) buildings with attractive features and high energy performance have a property value premium exceeding the expected economic value of energy saving.</p> <p>18. Costs reduction of buildings life cycle. Large scale interventions which introduce efficient technologies, lower construction costs (allowing economy of scale) and reduce maintenance, repair and operation costs.</p> <p>19. Resilience of energy infrastructures increased. Better response to loads peaks (the ability to prevent and react to them) and to adverse climatic events increases efficiency and safety in energy systems, reducing interruptions and blackouts.</p>

Box 1. List of nineteen key urban co-benefits detected in EU projects (based on Bisello 2017b)

5 Discussing Results

The activity developed in Seville actively involved 38 participants, organized into six groups, lead by as many facilitators. At the end of the session, six posters were collected, as many as audio recordings, and later on facilitator's notes⁴. This practical application got us interesting results concerning the adaptation of the WCM to the case study, as a successful collective opinion-building tool. Moreover, it delivers noticeable information about discussion dynamics among project

⁴ Two facilitators did not follow our request to hand in reflections of the discussion as notes, and after it became clear that audio recordings were unusable.

partners and finally the co-benefits joint ranking, as reported in the poster session.

5.1 Adaptations

The four main changes introduced in the usual WCM setting concerned table composition, freedom of movement, plenary poster session, and audio recording. Instead of letting participants free to approach the desired table, we introduced a pre-defined table composition, aimed at a mixture of affiliation and represented cities. Variety within the groups was necessary to spark diverse and lively discussion in a short time.

Secondly, participants were divided into varied composed groups and stakeholders were invited not to change table during the session, as our purpose was to reproduce the composition of partners' network of the project. In our particular study, this proved preferable, as we found in facilitator's notes, that participants needed some time to warm up to the tasks at hand and each other.

Third, each table appointed a speaker, presenting results during the plenary session. Instead of exchanging insights by switching tables, we asked our participants to present each table's findings in the last step to the whole group. Borrowing from focus group methods, we were also interested in how each group discussed the given questions and their answer as a group, instead of one common result.

The last point concern the attempt to an audio recording of group discussion, as usually done during a focus group. Since the audio recording of the group discussions did not work out, due to the noise of many people in one room, facilitators were asked to hand in reflection notes on their table's discussion. These notes gave insight into group dynamics, as well as how the group responded to questions and tasks. To understand the results (posters) and group conduct, it proved necessary to have data on the process of finding an agreement within each group.

5.2 Group Discussion Dynamics

In each discussion interlocutors influence each other, but also opinions are not always voiced (e.g. lack of commitment, silent protest) and views might change over the course of a conversation (Krueger 1997, 20f.). To assess these dynamics, we asked table moderators to provide notes directly after the WCM about what the discussion on their table was like and what interesting dynamics they observed. These notes showed that the groups were uncertain about how to start, what they had to do at the beginning of the discussion or had long debates about certain issues that seemed more relevant in some cities (or to some stakeholders) than others. Different perspectives and city specifics were noticed between stakeholders

from demo cities, early adopters and different socio-political contexts in the discussions.

Highlighting, that cities and experiences of particular contexts often were contrasted with each other, rather than stressing similarities between them. However, some notes also show, that after a while, and forced by the task to find a jointly ranking, participants did find similarities, became friendlier with each other and exchanged their particular experiences for common, long-term objectives of making cities more sustainable. In the discussion of group C for example, the facilitator noted, that based on an experience within one particular city, an issue was highlighted, relevant to other stakeholders and cities for their retrofitting endeavor. This group managed to come up with a "portfolio" for what they thought to be one of the most important issues within a project like SINFONIA.

"[...] participants were focusing on "health and well-being of tenants increased" (they decided to precise that this concern[ed] only occupants of refurbished buildings). They stressed how (based on the experience of Innsbruck), the energy efficiency issues seem to be not so relevant, in comparison with improving living conditions by adding balconies or lifts to quite old buildings. [...] Then most of the time was spent debating among three co-benefits: they grouped them into a "portfolio" related to social capital: "institutional relationships, new procedures, innovation in technology". They pointed out how relevant is the contribution of such projects in increasing trust among partners, personal contacts and forcing companies to find new solutions to overcome complex situations." (Group C, facilitator's notes)

This group's interpretation of the co-benefit "health and well-being increased" encountered two qualifications as (i) tenants, not residents were defined as a target group and (ii) retrofitting measurements were not seen as enough to argue for tenants' improvement of life. This concept is related to another co-benefit, suggested by group D: "Degree of satisfaction of the end-users".

Qualifying presented co-benefits as a group indicates an active and lively engagement with the questions and tasks of this WCM. Group F, for instance, came up with the slogan "from grey to green" to capture a common objective within each city. This group also thought of the new co-benefit "transforming innovation to mainstream life", which summarized their objective to transforming and linking "user awareness and behavior [particularly regarding energy consumption], innovation and technology development". Networks between partners, innovators, and end-users become strategically important. Indeed, effective networks support changes towards social, technological, governance and other kinds of innovation to "mainstream life":

"In involved institutes in SINFONIA something is changing because different offices or parts of institutes have to talk one each other and have to discuss with external stakeholders." (Group D, facilitator's notes)

Other interesting insight offered reflections from facilitators for group F and C, as they noted that sometimes particular or more experienced participants dominated the discussion, while moderator for group D stressed, "A real agreement was not found". Still, the discussions and tasks of WCM can be seen as successfully

bringing together stakeholders, exchanging early experiences, problems and overcoming barriers between them, as the same facilitator for group D pointed out in the notes.

5.3 Joint ranking

Moreover, it was interesting how the groups managed to come up with a joint ranking of most relevant co-benefits. According to group C and D facilitators' notes, the co-benefit "increasing assets value" was debated in the group sessions, although it did not end up in one of the rankings in the end. In both discussions, this was a disputed issue as there are different contexts in which the project is set in. Groups not only discussed one particular co-benefit in detail but also questioned how to measure some co-benefits and their direct connection to the SINFONIA project within its lifetime: e.g., "improvement of the local air quality", "local labor market stimulated" (group E). Group E acknowledged the importance of these issues (ranking them) but questioned whether the project could be concerned with such long-term goals that reach beyond the project's grasp.

Most prominent themes were those concerned with improving living conditions, technical and governance innovation, building social capital (institutional networks, relationships) and skills. Many groups and participants connected or even paired co-benefits together. Group F debated the value of "softer loan conditions" and argued that investment is important to get activities started. Still, the group ended up ranking "Institutional relationships and networks created" instead of "Softer loan conditions", as they felt that this was the much-needed baseline for improving relations between partners and – in the end – tackling environmental issues. Networks, personal contact, better organization and institutional barriers were often topics of discussion according to facilitators' notes. Exchanging specific contexts of these issues common goals most often featured improvement of residents' well-being and social components. As reported by group E, facilitator's notes "If we had to summarize the session, we could say that the impact on people was considered the most important and measurable among the co-benefits".

Aside from "smart services", the ranking of co-benefits dealing with other smart city categories shows a diverse picture at first. As displayed in Fig.1, almost all groups were focused on co-benefits falling within at least three different smart categories, while group B had a clear focus on only two. In general, co-benefits referring to the smart governance, smart economy and smart services appeared as most important and desirable aspects of the SINFONIA project.

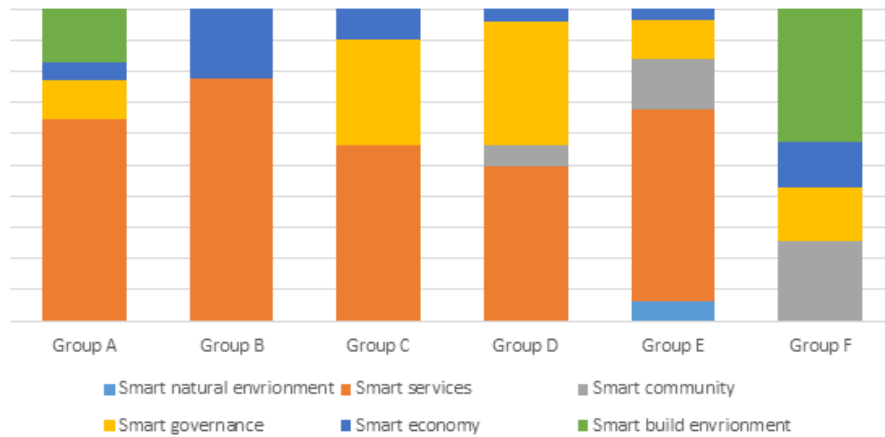


Figure 1: Poster session results: distribution of co-benefits among smart city categories

Moreover, three out of the six groups mentioned smart community aspects and smart build environment only concerned two of them. Just one group ranked smart natural environment aspects. For our study, this indicates that economic (smart economy) benefits, improving political and organizational networks (smart governance/community) and overall enhancing of resident's/tenant's life (smart services) are seen more important than direct effects on building structure (smart build environment) or natural resources (smart natural environment).

6 Conclusions

Creatively mixing WCM with other methods and introducing the topic beforehand proved successful in previous studies, as did its use for understanding collective insight of complex issues. Thus, adopting WCM fitted our specific aim of bringing together various perspectives in an informal setting to define collective insights, exchange ideas and grasp the cooperative attitude (Brown and Isaacs 2007) towards co-benefits of the SINFONIA project.

Merging WCM with the approach of focus groups (Morgan and Botorff 2010; Morgan and Scannell 1998) enabled us to access group dynamics, and deal with the challenge of the diverse backgrounds and unfamiliarity of participants of this inquiry. Discussions were sometimes long and difficult at the start, as moderators indicated. However, the questions and tasks given in WCM brought out at least smaller agreements and positive conversations between different positions. Participants were understood as a group(s) and became to understand each other and themselves as a collective with common goals (co-benefits) to strive for even if

geographical belonging and social, political and economic contexts influence discussion on co-benefits.

Anyway, at the end of this practical application, preference emerge towards co-benefits involving end-user behavior and intangible assets became clear. Overall indicating a higher interest in social aspects of co-benefits from the retrofitting endeavor, an essential concept to bear in mind during the next project phases.

A further research step will be to reassess the same group in a similar way after the project has finished. Introducing this additional element, we will borrow the logic from Delphi method, which lets participants predict future events or compare them later on with an earlier investigation in order to cope with unknown (problems) (Häder 2000, 12f.; Linstone and Turoff 1975). In this step, we plan to present the results of our first WCM to the same participants. We are going to ask which of their anticipated co-benefits came true, which failed, and what proved to be vital. By letting our participants reflect ex post, a threefold goal is achievable: understand our group's collective evaluation of co-benefits, compare it to their individual answers in a questionnaire and – in the last instance – see if they can report how expectations of co-benefits have met with reality. The purpose of this paper is finally to suggest the adoption of additional non-monetary criteria in assessing projects, suitable to measure and estimate ethics and social effects in cooperation with stakeholders. This way we interpret the message of the encyclical letter “Laudato si”, that provides the reference point of the annual SIEV Symposium 2016, as an invitation to overcome profit as the sole criterion for valuation and to offer an enhanced stakeholder participation in the definition of the valuation metrics. Moreover, the encyclical letter suggestions can be considered in the definition of weights, which can be attributed to the different objectives.

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