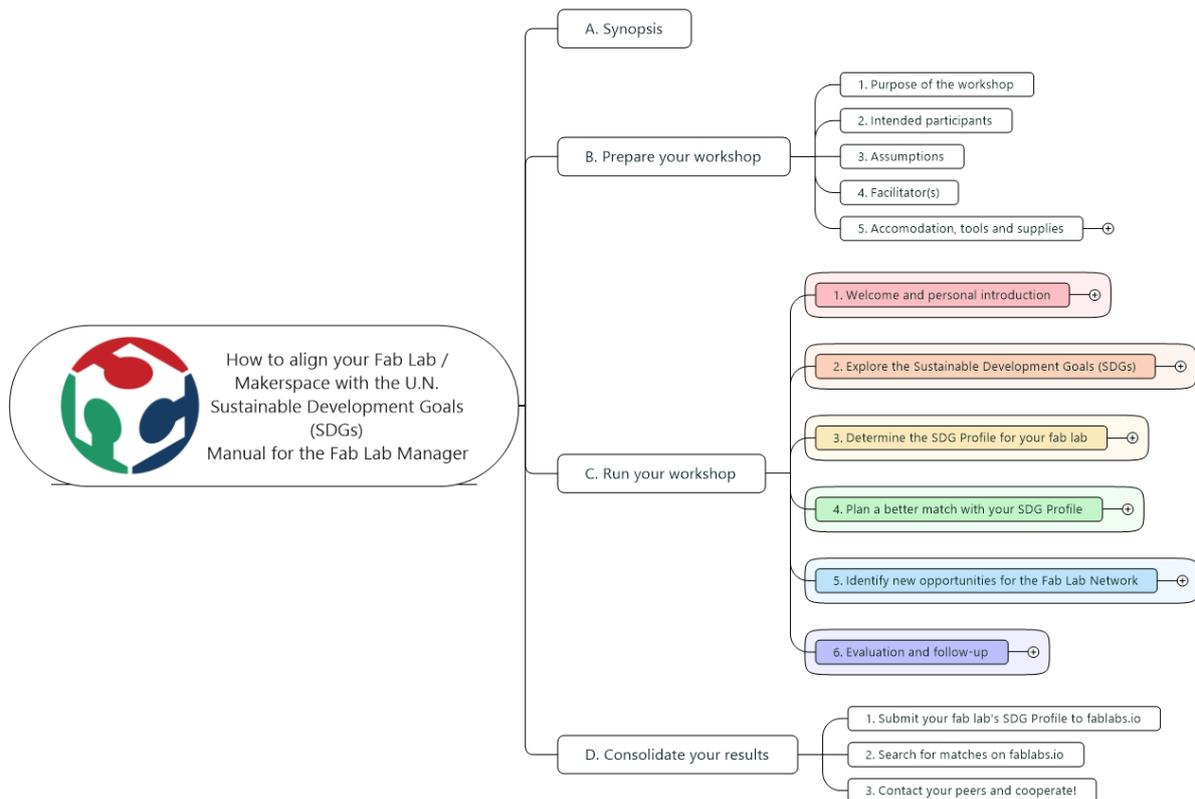


How to align your Fab Lab / Makerspace with the U.N. Sustainable Development Goals (SDGs)

Manual for the Fab Lab Manager



This document describes a generic workshop format for use in the fab labs, follow-up of the Workshop: Fab Labs and Sustainable Development Goals (SDGs); FAB14 – 14th Annual International Fab Lab Conference; Toulouse, France, 16-22 July 2018

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Where to find?

- This manual for the fab lab manager – <http://bit.ly/fab14-sdgs-fablabmanager>
- Slides to be used during workshop – <http://bit.ly/fab14-sdgs-presentation>
- Background info to be used during workshop – <http://bit.ly/fab14-sdgs-mindmap>
- Workshop materials – <http://bit.ly/fab14-sdgs-kit>
- Fab Lab SDG Profile Registration Form – <http://bit.ly/fab14-sdgs-form>

A. Synopsis



The logo's for the UN Sustainable Development Goals plus the fab lab logo

This workshop helps staff and volunteers of fab labs / makerspaces / innovation centers to align their organizations with the United Nations Sustainable Development Goals (SDGs). With some changes it could be applied to any community organization.

Fab labs?

- Fab labs and makerspaces are places with computers, software, tools, digital machines and all kinds of materials where the general public, youngsters, students, hobbyists, inventors and technopreneurs can make (almost) anything. You find them all over the world. The Fab Lab (FABrication LABoratory) concept was developed by Neil Gershenfeld, director of the <http://cba.mit.edu> at the Massachusetts Institute of Technology (MIT). The [Fab Foundation](#) supports the global fab community, a.k.a. the Fab Lab Network.

SDGs?

- The United Nations Sustainable Development Goals are a set of goals to end poverty, protect the planet and ensure prosperity for all, in fact a social economic agenda for all countries for 2016-2030. See also: <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>; versions in Arabic, Chinese, English, French, Russian, Spanish; further countries have dedicated websites on SDGs in other languages.

Why does it make sense to describe your fab labs external ambitions in the terms of SDGs?

- To clarify to yourself, to your peer labs and to the outside world your "profile" and thus the potential social impact of your lab;
- To focus your activities on making a useful contribution to achieving some SDGs.

- To reveal hitherto unknown options for cooperation and exchange between fab labs by having an insight in the "SDG Profiles" of all fab labs;
- To expose to the world the potential of the Fab Lab Network, its coverage of topics and its presence on the ground in almost every country.

A fab lab manager could prepare her fab lab's SDG Profile on her own. However, that would be a missed opportunity to bring staff and volunteers together to talk and share, not about their daily affairs but about their ultimate social impact. In a single session of 2-4 hours you can involve staff and volunteers in the process. You give them information, you receive valuable inputs from their daily operations, and together you forge the profile that best fits the lab.

B. Prepare your workshop

1. Purpose of the workshop

The purpose of the workshop is to help fab labs / makerspaces / innovation centers (or whatever community organization) to align their organizations with the United Nations Sustainable Development Goals (SDGs). With some changes it could be applied to any community organization.

2. Intended participants

The intended participants of the workshop are staff, volunteers, management and board members of a fab lab / maker space.

3. Assumptions

- **Origin of participants** - The participants come from the same fab lab and work on a shared vision on their fab lab and the SDGs. If they come from different labs, let them focus on what their labs have in common. Encourage them to re-run the workshop later in their own fab lab.
- **Number of participants** - The optimal number is a small group of 5-7 participants. If there are more (up to 35), work with subgroups of up to seven members. Give each subgroup its own co-facilitator. Let the subgroups work in parallel with now and then a short moment of exchanging / merging results and observations.
- **Focus** - The focus of the workshop is "outbound", i.e. the impact of the fab lab on the general public, the fab lab visitors and eventual clients. Bycatch of the discussion could be an "inbound" review of the SDGs leading to conclusions and possible actions for the fab lab's inside world, a.o. internal gender equality, internal waste handling.
- **Length of time** - Preparation time for new facilitators: 2 hours, set-up time 15 minutes, run-time 4 hours. A condensed session of 2 hours is possible, but not recommended.

Schedules for a regular (4 hour) session and a condensed (2 hour) session	Regular session [4 hours = 240 minutes]	Condensed session [2 hours = 120 minutes]
1. Welcome and personal introduction	30'	10'
2. Explore the Sustainable Development Goals (SDGs)	45'	20'
3. Determine the SDG Profile for your fab lab	45'	30'
4. Plan a better match with your SDG Profile	45'	30'
5. Identify new opportunities for the Fab Lab Network	45'	20'
6. Evaluation and follow-up	30'	10'
Total time	240'	120'

Table - Schedules for a regular (4 hour) session and a condensed (2 hour) session

4. Facilitator(s)

You need one facilitator and in case you work with subgroups (max. 7 participants each) a co-facilitator for each of the subgroups.

Facilitator(s):

- are familiar with fab labs / makerspaces, refer to <http://www.fabfoundation.org> and/or <http://bit.ly/fablalifecycle>;
- have basic knowledge of sustainable development goals, see <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>; versions in Arabic, Chinese, English, French, Russian, Spanish; many countries have dedicated websites on SDGs in their local language.
- have studied this manual.

5. Accommodation, tools and supplies

Accommodation

A quiet room, table and chairs. In case you work with subgroups: additional table plus chairs for each of the subgroups, the whole in cabaret setting.

Tools

Laptop with internet plus projector; loaded on laptop: Presentation: Fab Labs and Sustainable Development Goals; download from <http://bit.ly/fab14-sdgs-presentation>.

Ready on each subgroup table:

- SDG card deck, 20 cards (85*55 mm), download from <http://bit.ly/fab14-sdgs-kit>;
Options:
 - print on plain A4 paper and cut the "cards" manually (recommended)
 - print on business cards (clumsy and expensive)
- Overview of SDGs and underlying targets (1+17 pages, each participant should have easy access);
Options:
 - hyperlink to interactive mindmap (recommended); contains all information in a single HTML5 file, online available for every device; <http://bit.ly/fab14-sdgs-mindmap>
 - hyperlink to folder with 1+17 PDF files; no paper mess on the tables, possible mess on the screen; <http://bit.ly/fab14-sdgs-kit>
 - printed hand-outs; paper mess on the tables, expensive; <http://bit.ly/fab14-sdgs-kit>

Supplies

Ready on each subgroup table:

- SDG Planning Board form (2 A4 preferably pasted together along the long side); download from <http://bit.ly/fab14-sdgs-kit>.
- Adhesive tape, Markers, Pencils
- Post-it stickers
- Attendance list
- Evaluation forms (empty sheet of paper, A5 or A6)
- Optional: for each participant empty name badge / stickers

C. Run your workshop

Note: the Presentation: Fab Labs and Sustainable Development Goals contains slides for each step of the workshop. They describe the substeps from participant's perspective.

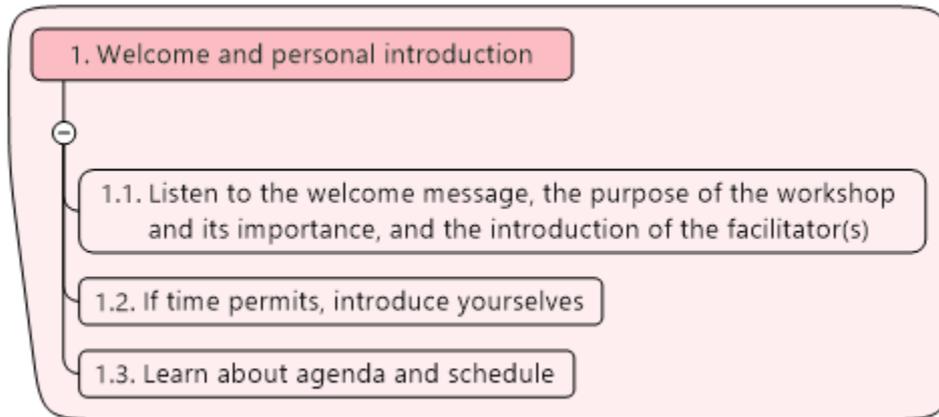


Agenda of the workshop (same for regular 4 h and condensed 2 h session)

1. Welcome and personal introduction

The goal of this step is to welcome the participants and explain what we are going to do.

Subgroups - If the number of participants is greater than 7, subgroups will be created.



Step 1 and its substeps

1.1. Listen to the welcome message, the purpose of the workshop and its importance, and the introduction of the facilitator(s)

- The facilitator welcomes the participants, introduces herself, and eventual co-facilitators and explains the purpose of this workshop (see Synopsis). Why is the participant's input essential? What type of output might be expected (the SDG Profile of your lab)? What happens with this profile, what might be its impact?

1.2. If time permits, introduce yourselves

- If time permits, and the group is not too large, the facilitator gives the participants the chance to introduce themselves as well.

1.3. Learn about agenda and schedule

- The facilitator explains the agenda and the amount of time available.
- **Subgroups** - In the case of subgroups, the facilitator explains that the results from parallel activities will be merged during the workshop. At the end there will be one shared SDG Profile for the lab.

2. Explore the Sustainable Development Goals (SDGs)

The goal of this step is to get acquainted with the 17 Sustainable Development Goals and to mobilize the already existing knowledge and experience in this area.

Subgroups - Whether there are subgroups or not, this step is a plenary activity.

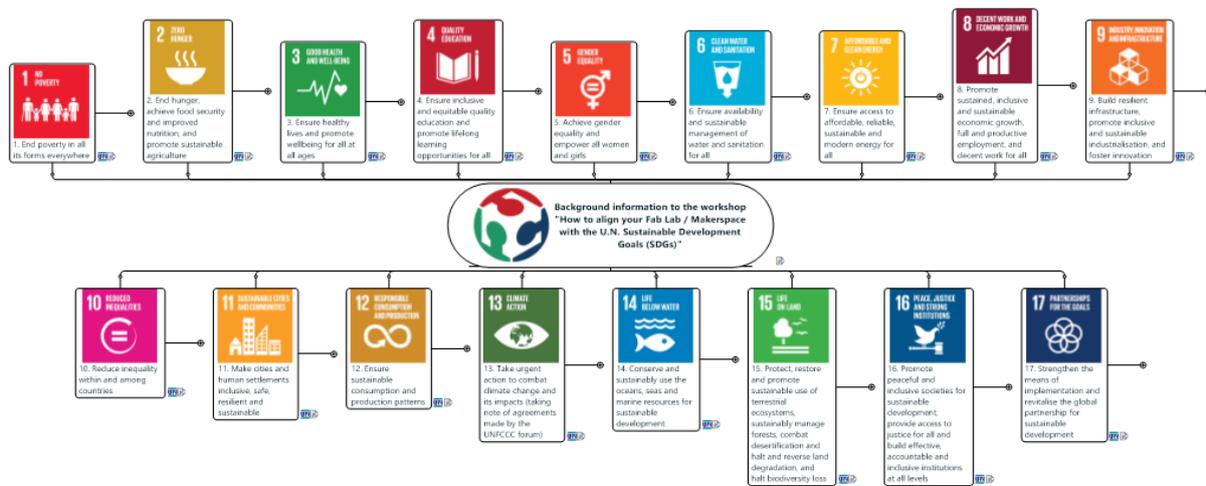


Step 2 and its substeps

2.1. Watch the presentation

- The facilitator introduces the concept of the 17 Sustainable Development Goals (SDGs) and shows what they can mean for fablabs. See the presentation.
- Important elements are:
 - In 2015, countries of the world agreed on 17 Sustainable Development Goals which have to be reached by all in 2030.
 - result of worldwide bottom-up process
 - 17 goals with 169 targets
 - time horizon 2016-2030
 - for all countries of the world
 - Paris climate agreement included
 - annually monitored
 - Although fab labs have many things in common, each of them has its own character based on the context in which it operates, the resources it has available and the interests of its staff and visitors. Fab labs can use the SDG's as a global frame of reference to express their mutual differences.
 - By its SDG Profile a fab lab can clarify its potential impact on local, regional and global scale. This helps the Fab Lab Network to align its social activities and to make the labs and the network more sustainable itself as well. Where sustainable development goals and fab lab goals coincide, new opportunities for structural cooperation and sustainable funding emerge.

2.2. Browse the 17 SDGs



Infographic: The 17 SDGs; see interactive mindmap at <http://bit.ly/fab14-sdgs-mindmap>

- The facilitator introduces the participants to the background documentation on the SDGs, i.e. documentation showing for each of the 17 SDGs the underlying 169 targets.
- The facilitator has three options:
 - hyperlink to interactive mindmap (recommended); contains all information in a single HTML5 file, online available for every device; <http://bit.ly/fab14-sdgs-mindmap>
 - hyperlink to folder with 1+17 PDF files; no paper mess on the tables, possible mess on the screen; <http://bit.ly/fab14-sdgs-kit>
 - printed hand-outs; paper mess on the tables, expensive; <http://bit.ly/fab14-sdgs-kit>

2.3. Tell about your personal experiences with SDGs so far

- The facilitator asks the participants about their possible experiences with SDGs.

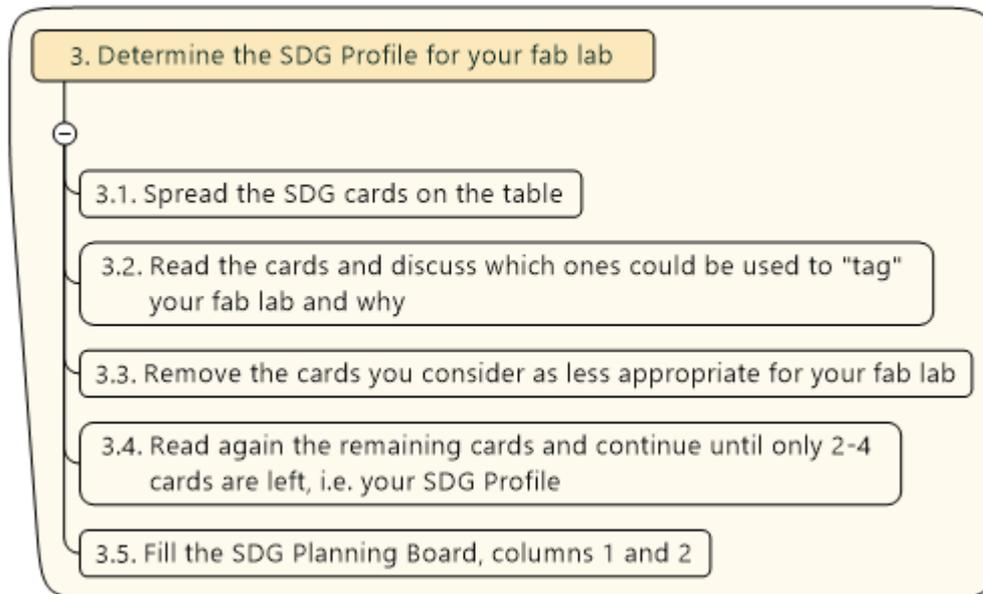
2.4. Listen to experiences of other participants

- The facilitator invites the participants to share their experiences with SDGs with the group.

3. Determine the SDG Profile for your fab lab

The aim of this step is to determine which 2-4 SDGs best suit the external orientation of the fab lab. We call this the SDG Profile of the fab lab.

Subgroups - If there are subgroups, the groups work separately from each other on the same substeps. The last substep, however, takes place in plenary. The subgroups then present their results and merge them into one SDG Profile.



Step 3 and its substeps

3.1. Spread the SDG cards on the table

- The facilitator gives a deck of SDG-cards to the participants (1 deck for each subgroup) and invites the participants to lay them down at the table (in an arbitrary order).

3.2. Read the cards and discuss which ones could be used to "tag" your fab lab and why

- The facilitator asks the participants to read the cards and to discuss which cards could be used to "tag" their fab lab and why. Criteria could be: the environment in which the fab lab operates, its audience, current activities, available hardware, software and tools, areas of interest and expertise of staff, etc.

3.3. Remove the cards you consider as less appropriate for your fab lab

- The facilitator asks the participants to remove the cards they all think are less appropriate to describe their fab lab.

3.4. Read again the remaining cards and continue until only 2-4 cards are left, i.e. your SDG Profile

- The facilitator asks the participants to repeat the procedure until not more than four cards remain. These 2-4 cards form the preliminary SDG Profile for their fab lab.

3.5. Fill the SDG Planning Board, columns 1 and 2

- The facilitator asks the participants to take the SDG Planning Board form:
 - Place your SDG Profile cards in the first column (use stickers for easy updating).
 - Fill the second column with your motivation to include a particular SDG into your SDG Profile.
- Subgroups - If there are subgroups, this is the moment to merge their results.** The facilitator invites the subgroups to present their findings and starts a plenary discussion to merge them. The result is a common and shared SDG Planning Board with not more than 4 SDGs (plus motivation).

SDG Planning Board		 <p>Determine the SDG-profile for your fab lab</p>
EXAMPLE FAB LAB XXX		
 <p>4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</p>	<p>Many activities in this field: information and demonstration to general public at events, workshops for different age groups, courses for 2D design and laser cutting, 3D design and 3D printing, fab academy, etc.</p>	
 <p>8. Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all</p>	<p>Two staff members with expertise in organizational health and safety, not only important internally, but we include it in many projects as well.</p>	
 <p>9. Build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation</p>	<p>Especially young professionals and technopreneurs: all is about new products and services, especially software and connectivity is very popular in our lab</p>	
 <p>17. Strengthen the means of implementation and revitalise the global partnership for sustainable development</p>	<p>Partnerships with local organizations, especially the support chain for new startups, active member of fab region and global network.</p>	

Example of SDG Planning Board with column 1 filled with selected SDG cards, column 2 filled with colored stickers

4. Plan a better match with your SDG Profile

The purpose of this step is to check (for the SDGs from the SDG Profile) what the official underlying "targets" are and determine how the fab lab could fit in with its activities.

Subgroups - If there are subgroups, the facilitator can distribute the SDGs from the SDG Profile across the different subgroups. The subgroups can then work separately from each other. During the last substep, the subgroups plenary present their findings and merge them into one consistent set of adjustments to the Fab Lab's activity program.



Step 4 and its substeps

4.1. For each SDG in your profile: review documentation on SDG and its underlying targets

- The facilitator asks the participants to go into the details of the SDGs belonging to their SDG Profile. Especially the underlying targets are relevant. They can be retrieved in the background documentation, e.g. the interactive mindmap.

4.2. Identify how your fab lab could contribute to these targets

- The facilitator asks the subgroups to indicate how their fab lab could contribute to the underlying targets.

4.3. Prepare an update of your fab lab activity program to let it better suit your fab lab's SDG Profile

- The facilitator asks the participants to describe what should be changed in their current activity program to make the possible contributions happen. The result would be that the updated fab lab activity program better matches their fab lab's SDG Profile.

4.4. Fill the SDG Planning Board, column 3

- The facilitator asks the participants to fill the third column on the SDG Planning Board with changes to their fab lab's activity program.



Screenshot: Interactive Mindmap - Click on SDG and see short intro in pane at the right, click on anchor (at right side of SDG icon) and the targets become visible, click on UN logo (at bottom right of SDG icon) and the browser opens the related UN SDG webpage - open the interactive mindmap in browser on laptop, tablet or smartphone via <http://bit.ly/fab14-sdgs-mindmap>

SDG Planning Board			
EXAMPLE FAB LAB XXX		Determine the SDG-profile for your fab lab	
	4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Many activities in this field: information and demonstration to general public at events, workshops for different age groups, courses for 2D design and laser cutting, 3D design and 3D printing, fab academy, etc.	NEW on our agenda: X Adults with almost no education, bring them back to learning processes, empower them for new job opportunities
	8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Two staff members with expertise in organizational health and safety, not only important internally, but we include it in many projects as well.	NEW on our agenda: X develop a practical toolkit for safety ambassadors
	9. Build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation	Especially young professionals and technopreneurs: all is about new products and services, especially software and connectivity is very popular in our lab	NEW on our agenda: X Build LoraWAN in our place and use it for citizen sensing
	17. Strengthen the means of implementation and revitalise the global partnership for sustainable development	Partnerships with local organizations, especially the support chain for new startups, active member of fab region and global network.	NEW on our agenda: X active contribution to fab region network X finally run our own fab academy

Example of SDG Planning Board with columns 1-2-3 filled

5. Identify new opportunities for the Fab Lab Network

The purpose of this step is to indicate what added value the fab lab can have for the Fab Lab Network (based on its SDG Profile); and vice-versa.

Subgroups - Whether there are subgroups or not, this step can be plenary.



Step 5 and its substeps

5.1. Review your fab lab's SDG Profile and updated activity program

- The facilitator follows the SDG Profile of the fab lab and asks for each SDG what the fab lab wants to do differently from now on.

5.2. Identify which (new) added value your fab lab has to offer to the Fab Lab Network

- The facilitator asks the participants to indicate which (new) added value the fab lab has to offer to the Fab Lab Network? Think also of possible cooperation with fab labs that have the same SDG Profile.

5.3. Brainstorm which added value the Fab Lab Network could offer to your lab, once fab labs all fab labs have developed their SDG Profile and updated their activity program

- The facilitator asks the participants what added value the Fab Lab Network could have for the fab lab. Assuming that at one point most of the fab labs have established an SDG Profile and adjusted their activity program accordingly.
- The facilitator checks whether the following points are taken into account:
 - To reveal hitherto unknown options for cooperation and exchange between fab labs by having an insight in the "SDG Profiles" of all fab labs;
 - To expose to the world the potential of the Fab Lab Network, its coverage of topics and its presence on the ground in almost every country.

5.4. Fill the SDG Planning Board, column 4

- The facilitator asks the participants to fill in their findings in the fourth column of the SDG Planning Board. This concerns the added value of the fab lab for the network and vice versa.

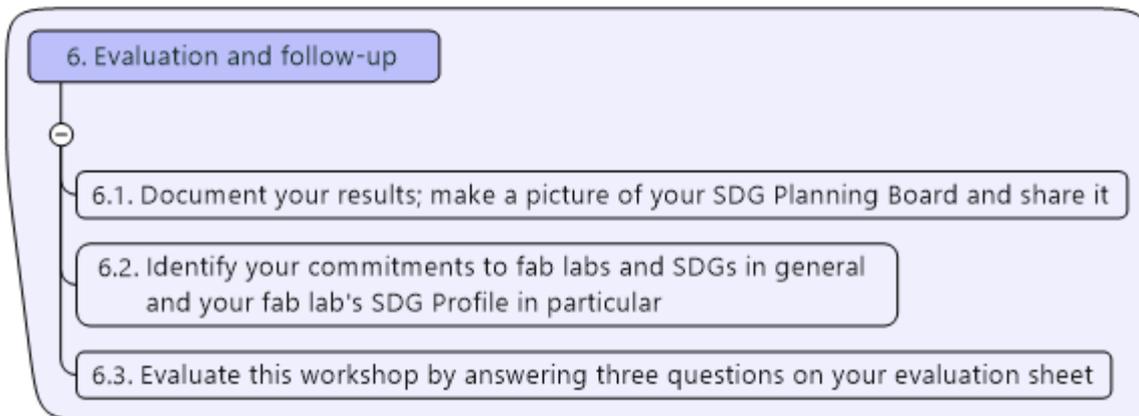
SDG Planning Board		 Determine the SDG-profile for your fab lab	 Plan a better match with your SDG profile	 Identify new opportunities for the fab lab network
EXAMPLE FAB LAB XXX				
 4 QUALITY EDUCATION	4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Many activities in this field: information and demonstration to general public at events, workshops for different age groups, courses for 2D design and laser cutting, 3D design and 3D printing, fab academy, etc.	NEW on our agenda: X Adults with almost no education, bring them back to learning processes, empower them for new job opportunities	Documenting our education activities and materials and actively offering them to our neighbour fab labs.
 8 DECENT WORK AND ECONOMIC GROWTH	8. Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all	Two staff members with expertise in organizational health and safety, not only important internally, but we include it in many projects as well.	NEW on our agenda: X develop a practical toolkit for safety ambassadors	Searching other fab labs interested in decent work and trying to create a handbook on that topic together.
 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	9. Build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation	Especially young professionals and technopreneurs: all is about new products and services, especially software and connectivity is very popular in our lab	NEW on our agenda: X Build LoraWAN in our place and use it for citizen sensing	Replicating software projects from CBA and see how we could apply them locally
 17 PARTNERSHIPS FOR THE GOALS	17. Strengthen the means of implementation and revitalise the global partnership for sustainable development	Partnerships with local organizations, especially the support chain for new startups, active member of fab region and global network.	NEW on our agenda: X active contribution to fab region network X finally run our own fab academy	Looking for our sister fab labs, communicating with them and planning at least one common activity this year

Example of SDG Planning Board with columns 1-2-3-4 filled

6. Evaluation and follow-up

The goal of this step is to make arrangements for the follow-up and evaluation of the meeting.

Subgroups - Whether there are subgroups or not, this step can be plenary.



Step 6 and its substeps

6.1. Document your results; make a picture of your SDG Planning Board and share it

- The facilitator emphasizes how important it is to properly document (and spread) the results of the workshop, ie the completed SDG Planning Board. Perhaps the texts only consist of separate words. In that case it would be very welcome if 1-2 volunteers would like to edit the texts immediately after the workshop. The facilitator ensures that at least a clear picture of the planning board is made and agrees with the participants what will happen to the planning board itself.

6.2. Identify your commitments to fab labs and SDGs in general and your fab lab's SDG Profile in particular

- The facilitator asks some participants for their opinion about fab labs, SDGs and their SDG Profile. What are they planning to do with the results of this workshop? What commitments do they want to make?
- The facilitator points out that also the fab lab management has a task in consolidating the results of this workshop. The fab lab management can include the SDG Profile in the overview of all fablabs on fablabs.io, search for fab labs with an identical SDG Profile, make contact with them and collaborate.

6.3. Evaluate this workshop by answering three questions on your evaluation sheet

- The facilitator asks the participants to evaluate the workshop in writing. All participants receive a piece of paper (A5 or A6). The facilitator asks them to answer three questions: 1) what went well? 2) what could be better ?, 3) what suggestions do you have further?
- The facilitator receives the completed evaluations and ensures that they are scanned and distributed among participants and fab lab management.

D. Consolidate your results

1. Submit your fab lab's SDG Profile to fablabs.io

The fab lab manager can add the SDG Profile to the overview of all fab labs on fablabs.io. For the time being, this will be done via a separate form and later, if the relevant software has been adapted, directly into fablabs.io.

The Working Group "Fab Labs and Sustainable Development Goals" receives the completed forms and records the data in a temporary database.

You can find the empty form on <http://bit.ly/fab14-sdgs-form> and you can complete and submit it online.

Fab Lab SDG-profile submission

Fab Lab management may use this form to send their outcomes of the local workshop "Fab Labs and Sustainable Development Goals SDGs" to the global workgroup with the same name.

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U.N. Sustainable Development Goals (SDGs)

1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY	6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND	16 PEACE, JUSTICE AND STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS	

Your fullname *

Screenshot - upper part of Fab Lab SDG Profile Submission Form

2. Search for matches on fablabs.io

When most of the fab labs have created and published their SDG Profile, you can filter the list of fab labs for the presence or absence of certain SDGs in the fab lab SDG Profiles. In this way it is possible to identify the fab labs with exactly the same SDG Profile as yours (your sister fab labs!).



Fictitious example of a fab lab twin and a fab lab triplet (based on identical SDG Profiles); background image: (c) Contributors of OpenStreetMap

3. Contact your peers and cooperate!

It can be very rewarding to make contact and get to know more about fab labs that have the same SDG Profile as your own fab lab. There is a lot of usable information, knowledge and experience to exchange. New relationships offer opportunities for all kinds of cooperation, including common presentation to the outside world and common projects.
