PROJECT FINAL REPORT

Publishable

HyGuide

FCH JU Grant Agreement No: ***256328***

Funding Scheme:	Coordination and Support Action
Project title:	Guidance document for performing LCAs on Hydrogen and Fuel Cell Technologies
Period Covered:	from 2010-10-01 to 2011-09-30
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Project Website:	http://www.fc-hyguide.eu/

Status: F

(D-Draft, FD-Final Draft, F-Final)

Dissemination level: PU

(PU – Public, RE – Restricted, CO – Confidential)

Publishable summary report

FC-HyGuide includes two autonomous projects and consortia: HyGuide and FC-Guide.

While FC-Guide focuses on fuel cell technologies HyGuide addresses hydrogen production systems.

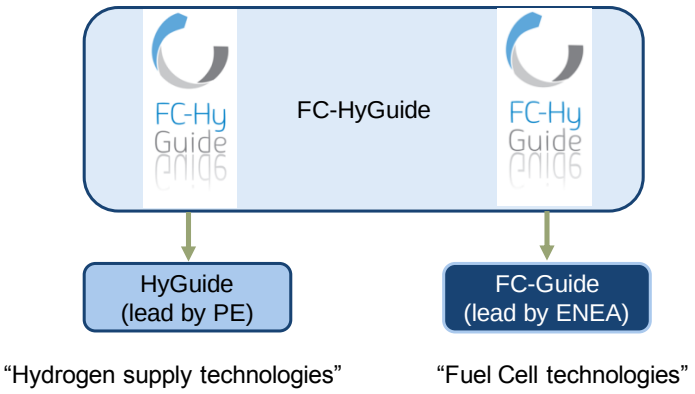

Figure **Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-1 - FC-HyGuide – Consortia structure

The two consortia, led by PE INTERNATIONAL resp. ENEA agreed during the project negotiation phase to collaborate closely. The collaboration included a common work programme, interlinked work packages, and common choices on key overall LCA methodological topics. The advisory board / review panel and the technical expert group were also shared by both consortia. The reason for the collaboration between the two consortia was to produce more value for the FCH JU funding and to avoid contradictory results. For that reason, the only public domain used, is FC-HyGuide.

The overall goal of the call “SP1-JTI-FCH.2009.5.5 LIFE CYCLE ASSESSMENT (LCA)” is to develop a specific guidance document(s) for application to hydrogen and fuel cell technologies and related training material with courses for practitioners in industry and research. These documents (one on hydrogen supply technologies, one on fuel cells) are based on and in line with the International Reference Life Cycle Data System (ILCD) Handbook, coordinated by the European Commission's JRC-IES.

In other words, the main objective of the FC-HyGuide project in the 12 months is the development of guidance documents and accompanying LCA report templates to evaluate the environmental benefits of new technologies in the field of fuel cell and hydrogen applications.

It is foreseen that the guidance documents developed within FC-HyGuide will be applied in all on-going and future FCH JU projects calling for Life Cycle Assessment (LCA).

The concept of the project is related to the international standardised procedure Environmental Product Declaration (EPD) System (ISO 14025), providing consistent information using common program and product category rules (PCR). The developed guidance documents (HyGuide and FC-Guide) are similar to a PCR document.

The guidance documents were developed in a multi stage stakeholder approach. In the first stage a draft version of the guidance documents were developed by the project consortia and introduced to the technical expert group of the project. Feedback gained during the expert group workshop was integrated and advanced versions of the guidance documents were prepared. In the following stage they passed a second consultation round. This consultation was public. Before the documents were finally released, an independent

external third party review process was performed to ensure the quality of the documents. Dissemination and communication were core elements and performed during the whole project period. Two training courses on the developed guidance documents completed the project. A graphical overview of the concept of stakeholder involvement within FC-HyGuide is given in the following graph.

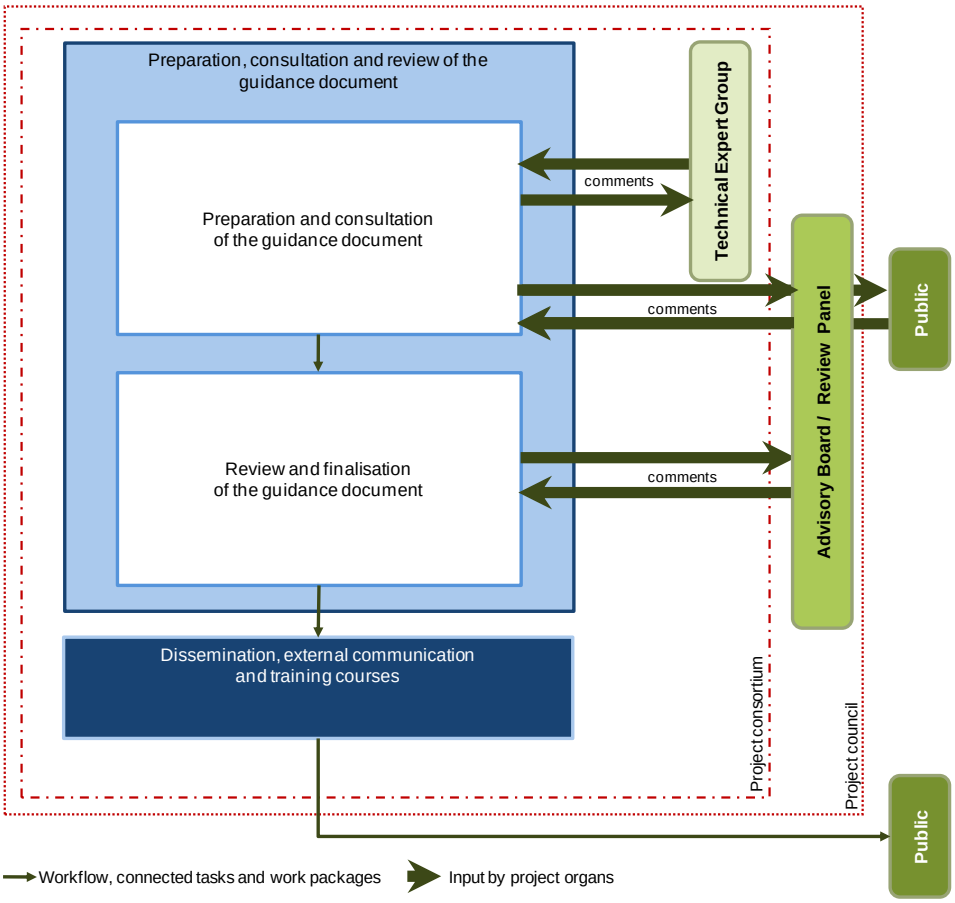

Figure Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-2: Major components of FC-HyGuide**

Considering the main objectives of the project, a detailed strategy was developed to assure their achievement in a structured and manageable way. In that regard, the project was structured in five work packages (excluding project management). Due to their inherent complexity, some of the work packages (WP) were structured in to different tasks.

- WP1 – Development, design, implementation and usage of a website: A project website was developed in which all project related information and materials can be found, see http://www.fc-hyguide.eu/. The website acts as fully integrated platform of the ILCD data network. The tasks were:
  - Task 1.1: Development of the website. The website is part of the ILCD data network, i.e. it is also the platform for storing life cycle data sets on hydrogen and fuel cells which will be developed in on-going FCH JU projects;
  - Task 1.2: Content provision: This task comprised the provision of content on the webpage, such as a general project description
- WP2 – Development of the structure and content of the guidance document, including key methodology aspects: Within this WP, a project kick-off meeting took place. This meeting was an important step for the share of knowledge among the partners of both

consortia, allowing the development of the draft guidance document, as well as the drafts for the LCA study reporting templates.

- WP3 – Preparation and consultation of the guidance documents: This WP was divided into five tasks.
  - Task 3.1: A workshop was organised to introduce the draft guidance document to the technical expert group and discuss it. The workshop was facilitated by an professional moderator.

    After the workshop, the draft guidance document was published on the project website, in the restricted area, where the members of the technical expert group (and advisory board / review panel) were able to review it and post their comments. Therefore, the members of the technical expert group had the opportunity to provide their feedback both on the workshop and on the website.
  - Task 3.2: A revised version of the guidance document was prepared after the workshop. The revised (advanced) version included the feedback from the workshop as well as the feedback received in the consultation timeframe after the workshop. The advanced guidance and a "comments & reply" document (compilation document with the cumulative feedback from the consultation round) were published at the restricted area of website.
  - Task 3.3: In this second consultation round, the technical expert group, the advisory board / technical expert group, and the public were able to comment on the document within a timeframe of six weeks. The main goal of the second consultation round was to validate the advanced guidance document, by investigating appropriateness, completeness, and usability. The feedback of the second consultation round was used to refine the guidance document.
  - Task 3.4: The draft of the final guidance document, based on the received comments – together with the comments & reply document – was prepared and published on the website.
  - Task 3.5: Before the final release, the review panel (independent group of experts) approved the documents. The finalisation step was of an iterative nature and in the end a final guidance document and a review report were published.
- WP4 – Case studies: The applicability of the guidance document was demonstrated by conducting case studies, i.e. LCAs of a hydrogen production and fuel cells technologies were conducted and the resulting data set are published on the website, as part of the ILCD data network. The experience gained by conducting the case studies was integrated into the guidance document. Therefore, the WP4 was strongly linked to WP3.

- WP5 – Dissemination, external communication, and training courses: The outcomes from WP3 and WP4 were directly used for application in workshops, training courses etc. As awareness, dissemination and usefulness are essential aspects to meet the FCH JU goals, special attention was given to the transfer of knowledge to industry and research members, on how to conduct LCA using the guidance documents. The training materials were revised and amended by the feedback gained during the two training courses in an iterative procedure to maximize their quality. The training materials are also available at http://www.fc-hyguide.eu/.

The applied concept and work programme were developed considering the following key objectives, defined by the FCH JU:

- Enabling the market breakthrough of fuel cell and hydrogen technologies and placing Europe as a leader in these technologies;
- Supporting RTD in member states and associated countries in a coordinated manner in order to avoid market failure, focus on developing market applications and facilitate a rapid development of fuel cells and hydrogen technologies;

- Supporting the implementation of RTD priorities of the multi-annual-implementation plan of the FCH JU;
- Encouraging increased public and private investment in fuel cell and hydrogen technologies;
- Ensuring the coordination and efficient management of funds. Supporting the principles of transparency and openness, competitiveness and excellence, inclusiveness and close cooperation among stakeholders in order to achieve the best possible benefit.

The main outcome of the project are two guidance documents on “how to perform Life Cycle Assessment (LCA) in the field of hydrogen production and fuel cell technologies”. These documents were developed in a peer reviewed stakeholder process (incl. public consultation) and are available (ready-to-use) for on-going FCH JU projects. The platform, as an integrative part of the ILCD data network, can be used as a hub for LCA data sets in the field of hydrogen and fuel cells.

For further information please visit http://www.fc-hyguide.eu/ or contact the coordinators via email info@fc-hyguide.eu.

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