

IMPLEMENTING AGREEMENT FOR ADVANCED MOTOR FUELS END OF TERM REPORT 2015–2019





AMF TCP End of Term Report 2015-2019

Introduction

The internal combustion engine (ICE), in combination with high energy density liquid fuels, has been the prime mover in road transport, mobile machinery, marine and aviation for a long period. In several applications, the ICE will keep its leading position for many decades to come.

The vast majority of the world legacy road vehicle fleet (more than 99 %) and even the majority of new vehicle registrations in 2018 (more than 95 %) are still powered with ICEs. Thus, it is imperative to call for emission and fuel efficiency regulations and vehicle technologies that continue to adequately deliver low real-life emissions and energy use with high quality fuels. AMF strives to reduce GHG emissions and local air pollutant emissions from the transport sector while ensuring availability and affordability of transport fuels. Here and now, alternative fuels such as methane, alcohols and paraffinic diesel can bring down local and greenhouse gas emissions and improve quality of living. Engines especially tuned for a particular fuel can display improved efficiency as well as reduced emissions. Alternative fuels can also contribute to security of fuel supply, and can stimulate local economic activity.

Mission statement

The mission of AMF is to provide sound scientific information and technology assessments that allow citizens and policy makers to make informed and science based decisions about options involving the use of advanced fuels for transportation systems. To provide such data to decision makers, AMF acts as a clearinghouse, by:

- Pooling resources and information on an international level;
- Identifying and addressing technology gaps and barriers to deployment;
- Performing cooperative research on advanced motor fuels;
- Demonstrating advanced motor fuels and related vehicle and after-treatment technologies; and
- Aggregating data and deriving key recommendations for decision makers within governments, municipalities, and industry

AMF fulfills its mission through international cooperation of academia, industries, governmental institutions, and nongovernment organizations. The Annexes in AMF are started to enable members to cooperate in groups that share common interests and to learn and grow as they interact and share different perspectives.

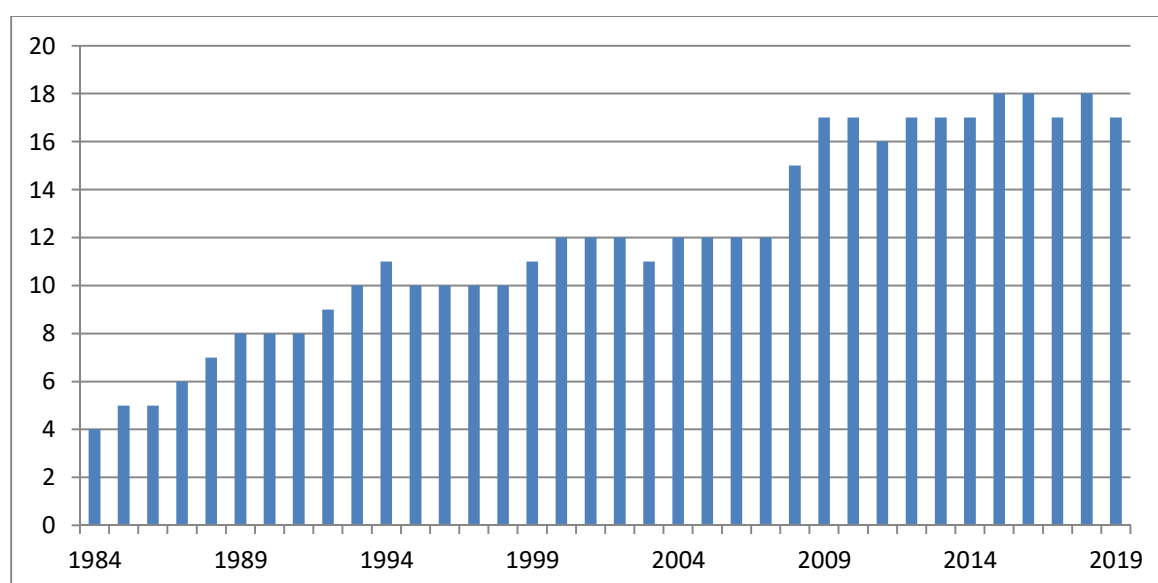
Membership

The main motivation of countries for participating in AMF is gaining access to the most relevant and up-to-date information regarding alternative motor fuels. The other important motivation is participating in the technical/research collaboration through annexes to share information, findings, and expertise.

The number of AMF contracting parties has continuously evolved over the years (see Figure 1). Current AMF members (as of May 2019) are Austria, Canada, Chile (joined in 2015), China, Denmark, Finland, Germany, India (joined in 2018), Israel, Japan, Korea, Spain, Sweden, Switzerland and USA. Japan participates with three distinct contracting parties. AMF members as of 2019 represent a population of 3.5 billion people (46% of world population), and also includes countries with forecasted tremendous increase in transport activities. France was a member from 2000 to 2016 and Italy from 1987 to 2015. Both withdrew due to shifts in directions of the participating institutions.

AMF is especially proud of having attracted several non-OECD members including China, India and Thailand¹. China and India are especially important members as they are large population and economies with rapidly rapid transport growth and transport fuel demand growth.

Figure 1: Number of AMF Contracting Parties over time



Operation Approach

To provide timely information to decision makers, AMF acts as a clearinghouse, by:

- Pooling resources and information on an international level, including support to build-up of technical competence;
- Identifying and addressing technology gaps and barriers to deployment of advanced motor fuels and vehicle technologies;
- Performing cooperative research on advanced motor fuels to advance technical understanding;
- Providing overviews on the demonstration of advanced motor fuels and related vehicle and after-treatment technologies;
- Aggregating data and findings to derive key recommendations for decision makers within governments, municipalities, and industry; and
- Communicating its findings actively through, e.g., briefs and its Advanced Motor Fuels Information system

¹ Thailand withdrew from AMF in 2018

AMF's strengths include an active Executive Committee, effective network of research institutions, capacity to develop and execute topical Annexes (projects), and comprehensive geographical representation (Asia, Europe, North-America, South-America). AMF fulfils its mission through international cooperation of academia, industries, governmental institutions, and nongovernment organizations. The annexes in AMF are executed to enable members to cooperate in depth to share common interests, to learn from each other, and to expand perspectives as they interact and share among them.

Management

To manage AMF's work program, the Executive Committee (ExCo) meets twice a year. Members discuss the progress made in active annexes, share results, and explore and start new annexes. Participation in these meetings is high; on average, 66% of the contracting parties are present at the ExCo meetings, along with 62% of the Operating Agents of active Annexes.

Table 1 lists the AMF ExCo meetings held or still to be held in the 2015–2019 term.

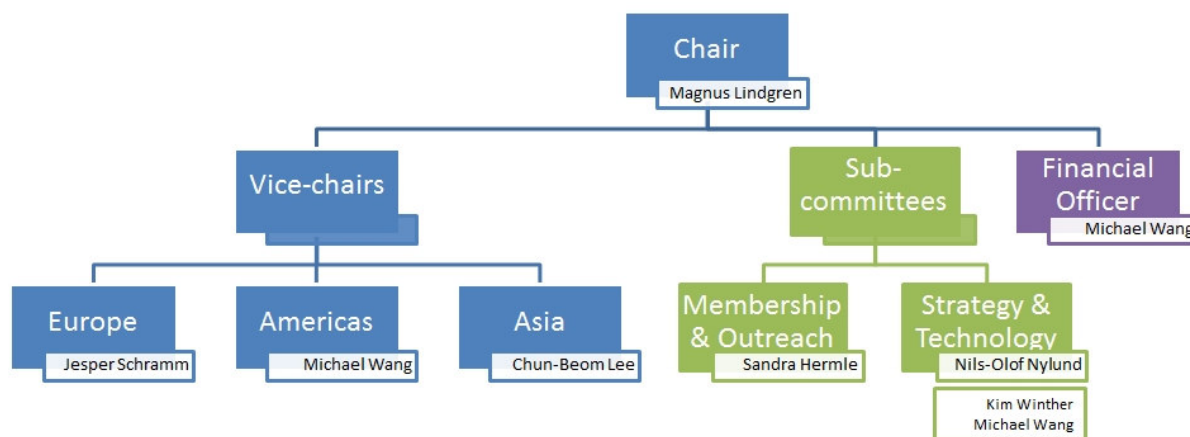
Table 1: AMF Executive Committee Meetings

| Meeting | Location | Time |
|---------|-----------------------|--------|
| ExCo 49 | Gwangju, Korea | Mar-15 |
| ExCo 50 | Jerusalem, Israel | Oct-15 |
| ExCo 51 | Chicago, USA | May-16 |
| ExCo 52 | Vienna, Austria | Oct-16 |
| ExCo 53 | Helsinki, Finland | May-17 |
| ExCo 54 | Tsukuba, Japan | Oct-17 |
| ExCo 55 | Bangkok, Thailand | May-18 |
| ExCo 56 | New Delhi, India | Oct-18 |
| ExCo 57 | Stockholm, Sweden | May-19 |
| ExCo 58 | Montreux, Switzerland | Nov-19 |

In a survey undertaken in 2018, delegates have stated that face-to-face ExCo meetings have provided the opportunity for in-person interactions, and annex progress and final reports have been very helpful, along with the AMF newsletter and the annual report. On the ExCo level, cooperation among participating members has been very good, and an active and extensive network has been formed.

Three sub-committees have been established for Technology, Strategy, and Outreach & Membership, respectively, and a financial Officer oversees the finances that are operated by the American Society of Engineering Education. To better distribute the workload of the management team, to streamline functions, and especially to avoid overburden on the ExCo Chair, the sub-committees for Technology and Strategy were merged at the fall 2017 ExCo meeting. The current AMF management structure is depicted in the following figure.

Figure 2: Current AMF management structure



Technological developments and recent trends and their implications for the AMF work programs and strategies are discussed at every ExCo meeting by leadership of the combined Strategy and Technology Sub-committee and the results of the subcommittee discussion are presented to all delegates during the ExCo meeting.

While delegates are satisfied with the currently evolving management structure of AMF, the ExCo continues to seek inputs from delegates and from the interactions with others (website, contacts to IEA) to continue to improve the AMF structure and operations, which are especially needed to start-up new annexes and to manage existing annexes.

Also, setting up collaborations with other TCPs is challenging, as any collaboration should meet the interest of all involved TCPs within a given timeframe. However, AMF informs related TCPs as early as possible about newly arising topics and actively seeks cooperation.

In the course of this working period, the ExCo has realized that the current AMF common fund budget does not allow supporting common interests within AMF apart from financing the Secretary, the dissemination annex and the annual report. The membership fee had not been raised since 2007 (not even adapted to inflation), and the budget required to pay for activities of common interest became larger than the available funds. Thus in 2018 it was decided to modestly raise the membership fee from € 9,500 per country to € 10,250 per country, starting from 2019. With the current 15 member countries, this raises the common fund budget by € 11,250 per year, a valuable asset which can be dedicated to topics of common interest. The first part of this money was used to commission a literature review on the potential for ammonia as a transportation fuel.

Work program during 2015-2019

The AMF work program is presented in detail in the RfE Questionnaire, where annex name, scope type, objectives, term, total budget, and key findings / lessons learned are presented for each of the annexes. In total, seven annexes from the previous 5-year term (2009-2014) rolled into this period (annexes 28, 44, 46, 48, 49, 50 and 51), and eight were initiated in this current 5-year term.

All of the activities that were envisaged in the Strategic Work Plan 2015-2019 to be undertaken in this term have been addressed. Also, outreach to countries that are forecast to rapidly increase transport demand in the future has been successful, as India has joined AMF in 2018.

AMF has operated according to its mission statement. Information has been collated and disseminated through AMF newsletters and through the Fuel Info section of the website (http://iea-amf.org/content/fuel_information/fuel_info_home). Technology gaps and barriers to deployment are continuously being identified and discussed during ExCo meetings, especially in the Strategy & Technology Sub-committee. Whenever feasible, gaps and barriers identified are addressed through an annex. Cooperative research on advanced motor fuels and demonstration of fuels, vehicle technologies and after-treatment technologies are being performed in almost all technical annexes as part of their work program. Finally, all AMF annexes result in final reports and the “Key Messages” synthesis documents, and both are published on the AMF website. In addition, several annexes have produced scientific publications.

The impact of AMF annexes, however, is far more than the documents produced. Below are some of the AMF main achievements:

- The newsletters produced under Annex 28 serve to inform national audiences of AMF member countries and are translated into Japanese.
- Annex 48 provides an overview on how to use natural gas and biogas and their derivatives in road transport.
- Annex 49 demonstrates the need to leapfrog from Euro IV or V to Euro VI emission standards to achieve real-life low emissions by motor vehicles.
- The driving cycle for buses in Santiago developed as part of AMF’s Annex 53 Sustainable Bus System was officially adopted by the Chilean Government. All new bus models that are coming to the bus market in Santiago must be tested under this cycle as part of the process of homologation. Annex 53 benefitted from exchange of researchers and adopting best practices.
- Results on fuel efficiency and tailpipe emissions acquired from several annexes on various fuels feed into the international emission model that Sweden maintains.
- Fuel and powertrain producers provide fuels or vehicles to AMF annexes and in turn their products have been evaluated and benchmarked against others.
- AMF delegates for Finland and Sweden have been/are involved in elaborating strategies on renewable transport fuels, using information from AMF annexes as a basis.

Summary/concluding statement

AMF is just concluding a successful working period. It has identified and addressed technological gaps and barriers to develop and deploy advanced motor fuels together with new vehicle technologies. Key recommendations to decision makers have been provided in all technical annexes in two-page synthesis documents to readily disseminate AMF findings for decision makers and other stakeholders. In addition, AMF has been successful in providing data and feedback to relevant IEA publications, and initiated a workshop on electrofuels. AMF members have found that AMF efforts are relevant to their countries and are looking forward to continuing in the next working period.