IMPLEMENTING AGREEMENT
FOR ADVANCED MOTOR FUELS
END OF TERM REPORT 2009–2015

iea Energy Technology Network

ADVANCED MOTOR FUELS IEA-AMF

Implementing Agreement for Advanced Motor Fuels (AMF IA)

End of Term Report 2009–2015

Reporting period: 31 August 2009 to 28 February 2015

Prepared in June 2014 by AMF ExCo Chairperson Sandra Hermle and Secretary Dina Bacovsky.

Based on contributions from AMF National Delegates and Annex Operating Agents.

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CONTENTS

STRATEGIC DIRECTION

The Implementing Agreement for Advanced Motor Fuels (AMF IA, or simply AMF) provides an international platform for cooperation to promote cleaner and more energy-efficient fuels and vehicle technologies. For the working period from 31 August 2009 through 28 February 2015, the strategic direction has been defined as cited below.

VISION

Our vision is to contribute to sustainable solutions through our system-wide view of the entire fuel chain, from resource development to end use. Our cooperative research in the field of transport fuels facilitates the widespread use of high-quality, sustainable fuels.

MISSION

AMF has been one of the key players in promoting international collaborations in the research and development (R&D), deployment, and dissemination of information on clean, energy-efficient, sustainable fuels and related vehicle technologies. Its mission is to continue providing a "fuel-neutral" platform for these cooperative activities, to make use of the multifaceted expertise of its partners and networks, and to provide a respected clearinghouse for information that will facilitate the widespread deployment of technologies for sustainable transport. We foresee an increased need for collaborating with other transport-related Implementing Agreements, such as the Bioenergy, Hybrid Electric Vehicle (HEV), and Combustion IAs. And, as we work together with new AMF member countries, we are looking forward to addressing an even more diverse set of challenges related to both technologies and local conditions. We will also continue actively working for energy conservation in transport.

STRATEGIC OBJECTIVES

AMF has defined three strategic objectives:

1. **Information Dissemination and Membership**
   We intend to gather, evaluate, and disseminate information on advanced motor fuels and to act as a clearinghouse for related information and to provide an easy-access platform for interested parties to become members of AMF.

2. **Cooperative R&D**
   Another goal is to create, maintain, and make use of the networks we and our partners have, conducting R&D and demonstrations related to advanced motor fuels.

3. **Markets and Deployment**
   Our third objective is to help identify technical and economic barriers and provide solid data to decision makers.

In carrying out its activities, AMF engages with its members and the relevant organizations within its member countries to collaborate on research and share examples of best practices. Some of our research has involved evaluating new technologies and fuels to verify their emissions and performance and comparing alternative technology options.

We communicate the results from our Annex work with the Working Party on Energy End-Use Technologies (EUWP) to help the IEA formulate recommendations on technology policies. We also disseminate results through our AMF website and newsletter and through our participating Delegates. The many national networks of our Delegates ensure that the dissemination of our information is broad and that we are targeting the appropriate policy makers.

AMF Executive Committee (ExCo) Delegates are affiliated with national governments, research institutions, universities, or the fuel industry. The heterogeneity of the group ensures lively discussions as well as practical solutions to problems. AMF's outreach to new members focuses on countries that

- Are expected to experience rapidly increasing volumes of traffic (e.g., China and India),
- Have severe problems with air pollution resulting from transport (e.g., Mexico),
- Import oil (most European countries), and
- Have a vast base for producing feedstock for biofuels (Brazil).

Several countries that are not members of IEA are already members of AMF, including China, Israel, and Thailand; others that are not members of IEA, such as Chile, are interested in joining AMF.

SCOPE

AMF's work scope is very broad, and, during the reporting period 31 August 2009 through 28 February 2015, 20 Annexes (two of which had two separate subtasks) were active. AMF Annex topics include the technical feasibility of using various fuels in internal combustion engines, the resulting emissions and engine efficiencies, measurement methodologies, comparisons of fuel or technology options for specific vehicles (including ships), infrastructure studies, and a guide to life-cycle analysis of transportation fuel pathways.

Table 1 on the following pages lists all the Annexes covered in the reporting period, together with a brief description of their objectives.

TABLE 1 AMF Topics Addressed 2009–2014

Annex 28: Information Service &AMF Website (AMFI) ***Status: Active***	**Annex 33: Particle Emissions of 2-S Scooters** ***Status: Completed***
This Annex collates information in the field of advanced motor fuels and makes it available to a targeted audience of experts in a concise manner.	This Annex involved basic research on the formation of aerosols in two-stroke (2-S) engines, a study of procedures for sampling and measuring particle mass and particle size distribution, research on improvements in exhaust gas after-treatment systems, and research on toxicity and new methods of measuring health effects.

TABLE 1 (Cont.)

Annex 34-1: Analysis of Biodiesel Options ***Status: Completed***	**Annex 34-2: Algae as a Feedstock for Biofuels** ***Status: Completed***
The overall objective of this Annex was to provide a better picture of where the biodiesel industry is going in the future – how technical barriers can be overcome, what bio-derived fuels can replace significant quantities of diesel fuel, what the feedstocks for those fuels can be, and what the processes that will make the fuels can be. The potential of different biodiesel options was linked to end-use aspects.	In this study, the project team assessed the state of the technology and opportunities associated with algal fuels. Both downstream activities (e.g., dewatering, oil/biomass extraction, conversion of algae and algal components to energy products) and upstream activities (e.g., strain selection, cultivation) were investigated. The study included an inventory and assessment of many various activities and made recommendations to help policy makers make wise decisions about which efforts to support.
Annex 35-1: Ethanol as a Fuel for Road Transportation ***Status: Completed***	**Annex 35-2: Particle Measurements: Ethanol and Butanol in DISI Engines** ***Status: Completed***
The purpose of this project was to provide an easy-to-read technical report about the applicability of ethanol as an engine fuel. The final report describes the potential for ethanol application in the member countries participating in this Annex. The results from the investigations of the member countries´ situations were extrapolated to recommendations for worldwide implementation in the near future.	As a result of the (1) increasing use of ethanol, (2) growing number of direct-injection, sparks-ignited (DISI) engines available from vehicle manufacturers, and (3) impacts of particulate matter formation on the design and effectiveness of after-treatment systems, there is a need to understand particulate matter (PM) formation due to the interaction of alcohol-gasoline blends in DISI engines. Initial research has shown that low-level ethanol blends could decrease PM formation; however, further confirmation is needed. Information on PM associated with the use of butanol blends in DISI engines is also limited.
Annex 36: Measurement Technologies for Emissions from Ethanol-Fuelled Vehicles – METEV ***Status: Completed***	**Annex 37: Fuel and Technology Alternatives for Buses** ***Status: Completed***
The aim of this project was to provide crucial information to use in developing the methodology for measuring hydrocarbon (HC), aldehyde, and alcohol tailpipe emissions from ethanol-powered vehicles. The project also aimed to find a simplified method that uses today's legislative measurement technology to account for differences in the harm caused by exhausts from gasoline-powered versus ethanol-powered vehicles.	The objective of this Annex was to bring together the expertise in IEA's transport-related Implementing Agreements to compile reliable information on the overall energy efficiency, emissions (greenhouse gas and local), and costs (direct and indirect) of various technology options for buses. The outcome of the task was unbiased and solid IEA-sanctioned data for use by policy makers and decision makers responsible for public transport using buses.
Annex 38: Environmental Impact of Biodiesel Vehicles ***Status: Active***	**Annex 39: Enhanced Emission Performance and Fuel Efficiency for HD Methane Engines** ***Status: Completed***
In this research, real-world emissions are determined through on-road driving tests using a portable emission measurement system (PEMS) with new diesel vehicles. These vehicles are adapted to meet the latest Japanese emission regulation requirements equivalent to EURO V (Phase 1 of this Annex) and EURO VI (Phase 2 of this Annex) requirements. Real-world fuel economy can also be investigated with the test vehicle used in this research.	The purpose of this Annex was to evaluate the performance of methane-fueled heavy-duty (HD) vehicles by considering their energy efficiency, emissions, and fields of application. A further objective was to enable homologation of dual-fuel engines within the United Nations Economic Commission for Europe (UNECE) Working Party on Pollution and Energy framework, and thus within the EU and other regions.

TABLE 1 (Cont.)

Annex 40: Life Cycle Analysis of Transportation Fuel Pathways ***Status: Completed***	**Annex 41: Alternative Fuels for Marine Applications – Future Marine Fuels Study** ***Status: Completed***
The purpose of this work was to improve the understanding of nontechnical people, senior managers, and policy makers about the life-cycle analysis (LCA) of transportation fuels and some of its pertinent issues. This work should provide some guidance to nations considering LCA-based policies and to people who are or will be affected by existing policies or those being developed.	The objective of this Annex was to compile information related to implementing alternative fuels within the European maritime sector. The data would enable the Annex to determine and recommend the most fiscally sound policies designed to achieve environmental compliance and the seamless integration of alternative fuels within existing infrastructures and to result in unfettered maritime trade practices and minimal impediments to ship owners and operators.
Annex 42: Toxicity of Exhaust Gases and Particles from IC-Engines – International Activities Survey ***Status: Active***	**Annex 43: Performance Evaluation of Passenger Car Fuel and Powerplant Options** ***Status: Completed***
This Annex offers information services and results in the transfer of knowledge. It helps the European Commission and other potential sponsors raise funds for the activities of the Engine Toxicity Network (EngToxNet) and helps to extend these activities worldwide. It informs and encourages the oversea partners/members to conduct activities that focus on toxicology and health risks.	The primary objective of this project was to produce comparative information on powerplant options with regard to their fuel efficiency, energy efficiency, and tailpipe emissions. By using selected vehicle platforms and basically performing “internal” comparisons between powerplant options, this approach emphasizes the differences between alternative engine technologies rather than differences between car makes and models; in essence, it “nullifies” the vehicles. Full fuel cycle performance was calculated by combining data from this Annex with Annex 37’s well-to-tank data on various fuels.
Annex 44: Research on Unregulated Pollutants Emissions of Vehicles Fuelled with Alcohol Alternative Fuels ***Status: Active***	**Annex 45: Synthesis, Characterization and Use of Hydro Treated Oils and Fats for Engine Operation** ***Status: Completed***
The main purpose of this project is to obtain the unregulated pollutant emission levels of alcohol-fueled vehicles and to gradually establish measurement methods for and limits on unregulated pollutant emissions. Furthermore, it examines the influences that measurement methods, automotive technology, alcohol content in the fuel, ambient temperature, test cycles, and other relevant factors have on a vehicle’s emissions of unregulated pollutants.	The goal of the project was to analyze the use of algae-HVO (hydrotreated vegetable oil), NExBTL (renewable biomass-to-liquid fuel produced by Neste Oil of Finland), FAME (fatty acid methyl ester), and eFAME (enzymatic FAME) as diesel substitutes in EURO VI diesel passenger car engines. Fuel analyses provided information on characteristics like heating values and cetane numbers. Engine tests focused on the impacts of fuels on combustion, emissions, and the efficiency of exhaust after-treatment systems. The fuels were also analyzed and compared with regard to their production costs and sustainability.

TABLE 1 (Cont.)

Annex 46: Alcohol Application in CI Engines ***Status: Active***	**Annex 47: Reconsideration of DME Fuel Specifications for Vehicles** ***Status: Active***
The goal of this Annex is to report on the best possible strategies for implementing alcohols in diesel engines. The project involves one of the main diesel engine producers in Europe and some of the most powerful research institutions and universities there. It is expected to compile data on worldwide frontline experiences and have a large influence on the strategies used by many countries to implement alternative fuels. The Annex will thus contribute to (1) supporting a sustainable energy policy, (2) supporting independence of fossil energy, and (3) supporting reduced emissions, including emissions of carbon dioxide.	The objective of this Annex is to investigate the effects of fuel impurities and additives on dimethyl ester (DME) diesel engine systems. The basic specifications will be taken from the draft values found in the ISO/TC 28/SC 4/WG 13 (International Standards Organization, Technical Committee 28, Subcommittee 4, Working Group 13) standards.
Annex 48: Value Proposition Study on Natural Gas Pathways for Road Vehicles ***Status: Active***	**Annex 49: COMVEC – Fuel and Technology Alternatives for Commercial Vehicles** ***Status: Active***
This value proposition study is investigating the different pathways for using natural gas (NG) in on-road vehicles, with a focus on their advantages and disadvantages. Pathways to be assessed include compressed natural gas (CNG), liquefied natural gas (LNG), synthetic fuels derived from NG, and electricity derived from NG. Aspects being considered include, but are not limited to, cost, life-cycle emissions, energy consumption, and societal implications. The goal is to identify the most cost-effective and technically feasible way to utilize NG in road transportation that could cause NG to emerge into the mainstream market instead of maintaining a niche market in many countries.	This project aims to deliver comparable data on the tailpipe emissions and energy consumption of commercial light-duty and heavy-duty vehicles. The goal is to gain more knowledge in order to make the best allocation of alternative fuels and technologies for road transport. This project will strongly support the development of deployment strategies for alternative fuels and energies.
Annex 50: Fuel and Technology Alternatives in Non-Road Engines ***Status: Active***	**Annex 51: Methane Emission Control** ***Status: Active***
This project will focus on tractors and construction equipment. It will provide the current status of engine technologies in use, evaluate representative operational conditions and load patterns, and assess the effects of fuel and alternative technologies on emissions and fuel efficiency.	Methane slip is still an issue for certain types of gas engines. This project will study the theoretical background of combustion in methane engines and of chemical reactions in methane catalysts, evaluate new engine concepts and catalysts, follow up on existing heavy-duty methane vehicles and their performance, evaluate the effects of gas quality on engine performance and emissions, and evaluate the potential for retrofit solutions.

ANNEX ACTIVITIES

The AMF IA work programme covers a broad range of activities, from literature reviews and method development to data collation, dedicated experimental work, data assessment, and information dissemination. Dedicated experimental work often includes engine bench tests, chassis dynamometer tests, and real-world driving. Method development may be related to the development of the testing procedure or to the development of appropriate measurements. Information dissemination is an integral part of each Annex, since the final report is made publicly available on the AMF website (www.iea-amf.org), and some of the final reports are printed and distributed at conferences. In addition, the Annex results are often presented at conferences or published in scientific papers. Table 2 illustrates the type of activities carried out under each of the Annexes.

TABLE 2 Annex Activities

Annexes/Activities	Literature Review	Method Development	Data Collation (Existing Data)	Experimental Work (Generating New Data)	Data Assessment/ Evaluation	Information Dissemination
Annex 28: Information Service & AMF Website (AMFI)			X			X
Annex 33: Particle Emissions of 2-S Scooters				X		X
Annex 34-1: Analysis of Biodiesel Options	X		X		X	X
Annex 34-2: Algae as a Feedstock for Biofuels	X		X	X	X	X
Annex 35-1: Ethanol as a Fuel for Road Transportation	X					
Annex 35-2: Particle Measurements: Ethanol and Butanol in DISI Engines				X	X	X
Annex 36: Measurement Technologies for Emissions from Ethanol Fuelled Vehicles METEV	X	X		X	X	X
Annex 37: Fuel and Technology Alternatives for Buses			X	X	X	X
Annex 38: Environmental Impact of Biodiesel Vehicles				X	X	X
Annex 39: Enhanced Emission Performance and Fuel Efficiency for HD Methane Engines	X	X	X	X	X	X
Annex 40: Life Cycle Analysis of Transportation Fuel Pathways			X		X	X

TABLE 2 (Cont.)

Annexes/Activities	Literature Review	Method Development	Data Collation (Existing Data)	Experimental Work (Generating New Data)	Data Assessment/ Evaluation	Information Dissemination
Annex 41: Alternative Fuels for Marine Applications – Future Marine Fuels Study	X	X		X		X
Annex 42: Toxicity of Exhaust Gases and Particles from IC-Engines – International Activities Survey	X		X			X
Annex 43: Performance Evaluation of Passenger Car Fuel and Powerplant Options	X	X	X	X	X	X
Annex 44: Research on Unregulated Pollutants Emissions of Vehicles Fuelled with Alcohol Alternative Fuels	X			X	X	X
Annex 45: Synthesis, Characterization and Use of Hydro Treated Oils and Fats for Engine Operation	X			X	X	X
Annex 46: Alcohol Application in CI Engines	X		X	X	X	X
Annex 47: Reconsideration of DME Fuel Specifications for Vehicles		X	X	X		X
Annex 48: Value Proposition Study on Natural Gas Pathways for Road Vehicles			X	X	X	X
Annex 49: COMVEC — Fuel and Technology Alternatives for Commercial Vehicles	X	X	X	X	X	X
Annex 50: Fuel and Technology Alternatives in Non-Road Engines	X		X	X	X	X
Annex 51: Methane Emission Control	X		X	X	X	X

EXCO ACTIVITIES

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 discuss and start new Annexes. Participation in these meetings is high; on average, 78% of the contracting parties are present at the ExCo meetings, along with 93% of the Operating Agents of active Annexes.

Table 3 lists the AMF ExCo meetings held or yet to be held in the 2009–2015 working period. ExCo meetings 37 and 38 from 2009 are listed in this report because they were not listed in the 2005–2009 End of Term Report.

TABLE 3 AMF Executive Committee Meetings

ExCo 37	Helsinki, Finland	May 2009
ExCo 38	Bangkok, Thailand	November 2009
ExCo 39	Ottawa, Canada	May 2010
ExCo 40	Thessaloniki, Greece	November 2010
ExCo 41	Karlsruhe, Germany	May 2011
ExCo 42	Istanbul, Turkey	October 2011
ExCo 43	Zürich, Switzerland	May 2012
ExCo 44	Beijing, China	October 2012
ExCo 45	Gothenburg, Sweden	May 2013
ExCo 46	Santiago, Chile	November 2013
ExCo 47	Copenhagen, Denmark	May 2014
ExCo 48	Jerusalem, Israel	October 2014

FUNDING

The AMF Implementing Agreement is funded through yearly membership fees of 9,500 € ($13,008 US). This money forms the common fund of the entire AMF IA. Annexes that are of interest to all contracting parties, such as the Information Dissemination Annex, as well as the work of the Secretary, are funded through the common fund.

Depending on what seems most appropriate for a specific Annex, cooperative effort is either cost-shared, task-shared, or a combination of both. Examples follow.

Annexes 28 and 42 are financed from the common fund; thus, funding is completely cost-shared among all contracting parties. Work that is of interest to all contracting parties is carried out by the Operating Agent in these cases.

Annexes 35-2 and 43 are completely task-shared. All participants contribute their own work, which is carried out in a pre-agreed-upon work program. All participants take care of their own expenses. The costs for coordinating the individual contributions and preparing the Annex's report are funded by the government of the Operating Agent.

Annexes 37 and 44 are examples of combined cost-shared and task-shared funding. Some participants even contribute both work and funds.

This flexibility in funding allows the AMF Annexes to meet the specific needs of their contracting parties. Table 4 lists the budgets of individual AMF Annexes and shows whether the cooperative effort is cost-shared (CS), task-shared (TS), or both.

TABLE 4 AMF Annex Budgets and Type of Funding

Annex	Title	Type	Budget in € ($ US Equivalent)
28	Information Service & AMF Website (AMFI)	CS	52,000 (71,204)
28-1	Information Service & AMF Website (AMFI) – Fuel Info Subtask	CS	30,000 (41,079)
28-2	Information Service & AMF Website (AMFI) – Website Refresh Subtask	CS	19,000 (26,017)
33	Particle Emissions of 2-S Scooters	TS	20,000 (27,386)
34-1	Analysis of Biodiesel Options	CS	75,000 (102,698)
34-2	Algae as a Feedstock for Biofuels	TS+CS	150,000 (205,395)
35-1	Ethanol as a Fuel for Road Transportation	TS	70,000 (95,851)
35-2	Particle Measurements: Ethanol and Butanol in DISI Engines	TS	225,000 (308,093)
36	Measurement Technologies for Emissions from Ethanol Fuelled Vehicles – METEV	TS+CS	150,000+ (205,395+) contributions from industry
37	Fuel and Technology Alternatives for Buses	TS+CS	1,100,000 (1,506,230)
38-1	Environmental Impact of Biodiesel Vehicles – Phase 1	TS+CS	139,800 (191,428)
38-2	Environmental Impact of Biodiesel Vehicles – Phase 2	TS+CS	95,000 (130,084)
39-1	Enhanced Emission Performance and Fuel Efficiency for HD Methane Engines – Phase 1	CS	25,000 (34,233)
39-2	Enhanced Emission Performance and Fuel Efficiency for HD Methane Engines – Phase 2	TS+CS	365,000 (499,795)
40	Life Cycle Analysis of Transportation Fuel Pathways	TS+CS	50,000 (68,465)
41	Alternative Fuels for Marine Applications – Future Marine Fuels Study	TS+CS	80,000 (109,544)
42	Toxicity of Exhaust Gases and Particles from IC-Engines – International Activities Survey	CS	48,000 (65,726)
43	Performance Evaluation of Passenger Car Fuel and Powerplant Options	TS	450,000 (616,185)
44	Research on Unregulated Pollutants Emissions of Vehicles Fuelled with Alcohol Alternative Fuels	TS+CS	80,000 (109,544)
45	Synthesis, Characterization and Use of Hydro Treated Oils and Fats for Engine Operation	TS	186,000 (254,690)

TABLE 4 (Cont.)

Annex	Title	Type	Budget in € ($ US Equivalent)
46	Alcohol Application in CI Engines	TS	290,000 (397,097)
47	Reconsideration of DME Fuel Specifications for Vehicles	TS	Task sharing
48	Value Proposition Study on Natural Gas Pathways for Road Vehicles	TS+CS	93,000 (127,345)
49	COMVEC – Fuel and Technology Alternatives for Commercial Vehicles	TS+CS	250,000 (342,325)
50	Fuel and Technology Alternatives in Non-Road Engines	TS+CS	to be defined
51	Methane Emission Control	TS+CS	~500,000

MEMBERSHIP

Membership in the AMF IA has grown significantly over the years. AMF was founded in 1984 by Canada, Sweden, and the United States. Membership has first grown and now has stabilized, as displayed in Figure 1.

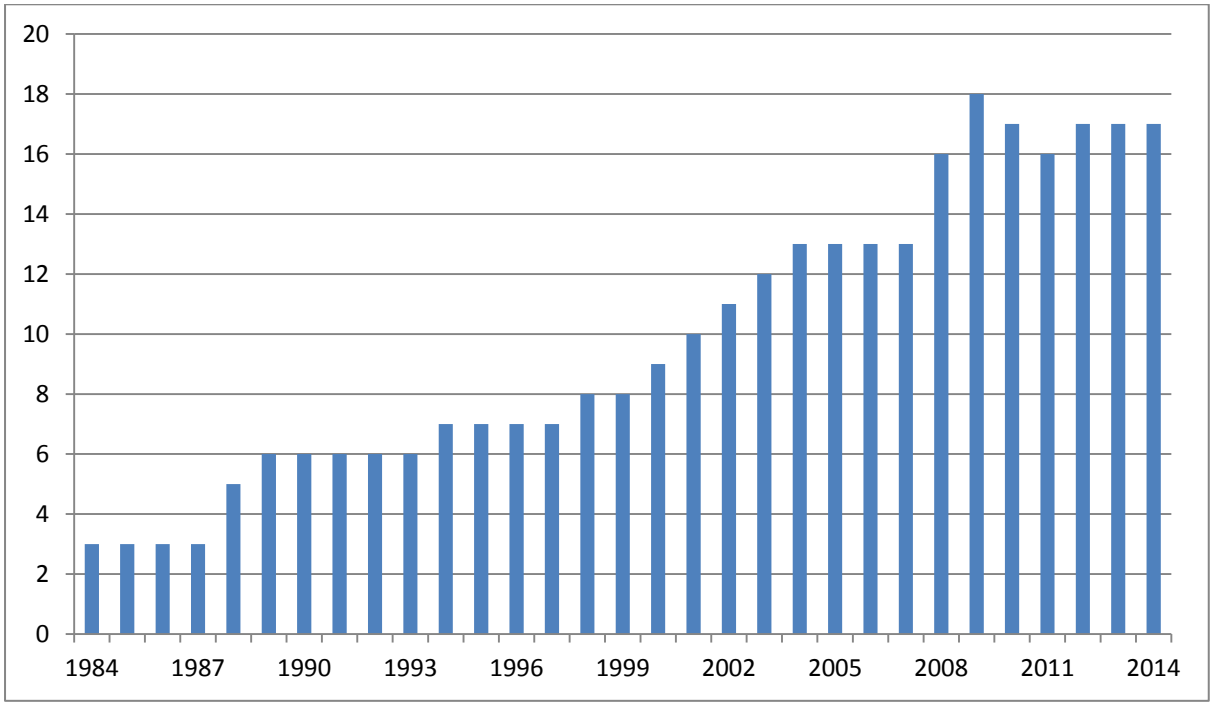

FIGURE 1 Number of AMF Contracting Parties from 1984 to 2014

Australia, Belgium and UK withdrew from the Implementing Agreement in the current working period due to budget restraints; Israel and South Korea joined, and Chile currently is in the process of joining. AMF now is made up of 17 contracting parties from 16 countries, as listed in Table 5.

TABLE 5 AMF IA Contracting Parties

ADEME	France
Austrian Agency for Alternative Propulsion Systems (A3PS)	Austria
CanmetENERGY	Canada
China Automotive Technology and Research Center (CATARC)	China
eni S.p.A.	Italy
Fachagentur Nachwachsende Rohstoffe (FNR)	Germany
IDAE	Spain
Korea Institute of Energy Technology Evaluation and Planning (KETEP)	Republic of Korea
Ministry of National Infrastructure, Energy and Water Resources	Israel
National Institute of Advanced Industrial Science and Technology (AIST)	Japan
Organisation for the Promotion of Low Emission Vehicles (LEVO)	Japan
PTT Research and Technology Institute	Thailand
Swedish Transport Administration (STA)	Sweden
Swiss Federal Office of Energy (SFOE)	Switzerland
Technical University of Denmark (DTU)	Denmark
The Technical Research Centre of Finland (VTT)	Finland
U.S. Department of Energy (DOE)	USA

AMF, through its outreach subcommittee, actively reaches out for new members. The ExCo has discussed industry participation through the category of Sponsors and decided that they will be welcome to the Agreement. However, one of the strengths of AMF is its unbiased approach which is not driven by individual interests. Thus Sponsors are not given the right to start new Annexes.

The participation of contracting parties in individual Annexes is shown in Table 6 for Annexes *2*8–38 and Table 7 for Annexes 39–51.

TABLE 6 Participation of Contracting Parties in Annexes 28 through 41

Participant	28	33	34	35	36	37	38	39	40	41
Australia	X									
Austria	X			X					X	
Canada	X	X	X	X	X	X	X	X	X	X
China	X			X						
Denmark	X	X		X						X
Finland	X	X	X	X	X	X	X	X	X	X
France	X	X		X		X			X	
Germany	X						X	X	X	X
Israel	X									
Italy	X	X	X	X						
Japan LEVO	X		X	X		X	X	X	X	
Japan AIST	X									
Korea	X									
Spain	X			X						
Sweden	X			X	X	X	X	X		
Switzerland	X	X		X		X				
Thailand	X			X		X	X		X	
United Kingdom	X									
United States	X		X	X	X	X	X		X	

TABLE 7 Participation of Contracting Parties in AMF Annexes 42 through 51

Participant	42	43	44	45	46	47	48	49	50	51
Australia	X									
Austria	X									
Canada	X	X	X	X			X	X		
China	X	X	X				X	X		
Denmark	X			X	X		X	X		X
Finland	X	X	X	X	X		X	X	X	X
France	X									
Germany	X			X					X	X
Israel	X		X				X	X		
Italy	X									
Japan LEVO	X	X				X		X		X
Japan AIST	X									
Korea	X					X		X		X
Spain	X									
Sweden	X	X	X		X	X		X	X	X
Switzerland	X		X							
Thailand	X					X		X		
United Kingdom										
United States	X	X		X			X	X		

CONTRIBUTIONS OF AMF TO THE IEA ENERGY TECHNOLOGY NETWORK (ETN)

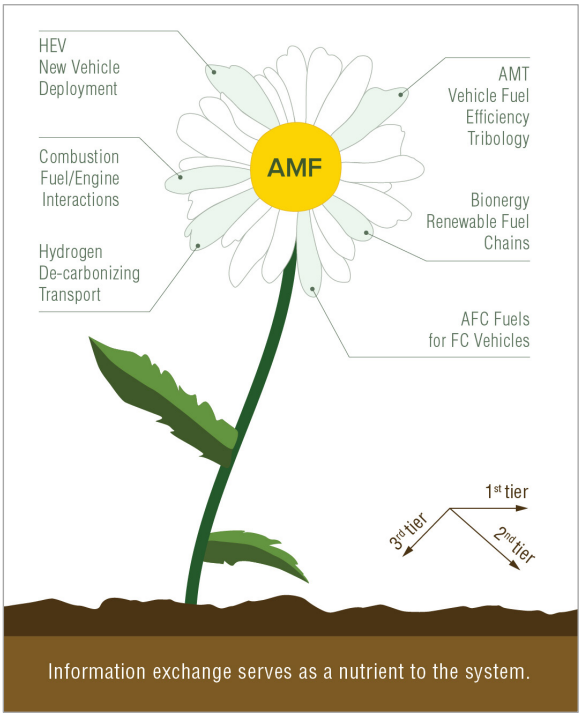

FIGURE 2 In the automotive industry, tier 1 companies supply components directly to vehicle manufacturers. Tier 2 companies supply parts to tier 1 companies, and the chain continues with the tier 3 companies. AMF is working closest with Combustion and Bioenergy, because they cover technologies that enable fuel production and combustion; HEV and AFC also provide transport, but through different type of powertrains not covered by AMF. Hydrogen and AMT are even further away from AMF, but they also contribute to a sustainable transport system. ETDE (Energy Technology Data Exchange, GOT (Gas Oil Technologies), and RETD (Renewable Energy Technology Deployment) provide strategic guidance to all of these IAs.

Other IAs related to the AMF IA — such as the Bioenergy, Combustion, HEV (Hybrid and Electric Vehicles), AFC (Advanced Fuel Cells), Hydrogen, and AMT (Advanced Materials for Transportation) IAs, as well as the RETD (Renewable Energy Technology Deployment), ETDE (Energy Technology Data Exchange), and GOT (Gas and Oil Technologies) IAs — are regularly informed about AMF IA developments through ExCo summaries, AMF newsletters, and invitations to ExCo meetings. Figure 2 illustrates the relationships between the AMF IA and other IAs.

AMF ExCo Delegates Andreas Dorda, Sandra Hermle, and Birger Kerckow are also members of other Executive Committees (HEV, Combustion, and Bioenergy), and they regularly provide updates to and from these groups. Bioenergy Task 39 sends a representative to participate in AMF ExCo meetings; in addition, AMF Secretary Dina Bacovsky is also a national Delegate to Bioenergy Task 39.

AMF and Bioenergy Task 39 have provided a joint conference session at the International Symposium on Alcohol Fuels (ISAF). AMF and Bioenergy held a joint workshop on "Infrastructure Compatible Transport Fuels," along with their ExCo meetings in Copenhagen, Denmark, in May 2014. At the same ExCo meeting, HEV and AMF ExCo members met to discuss their strategies and to exchange ideas for joint activities. Common Annexes have been set up between AMF and Bioenergy (Annexes 37 and 39), and a joint summary of the two algae reports produced by AMF and Bioenergy Task 39 has been published.

Finally, Nils-Olof Nylund, former ExCo Chair and now Senior Vice-Chair of AMF ExCo and the Delegate for Finland, participates in the IEA Transport Contact Group (TCG) and Working Party on Energy End-Use Technologies (EUWP) and is Vice-Chairman for Transport in EUWP. He also participates in other activities, such as workshops of the IEA Energy Technology Network (ETN).

CONTRACTUAL AND MANAGEMENT REQUIREMENTS

The AMF IA is managed by the Executive Committee, which consists of one Delegate from each contracting party.

This is the decision-making body of the IA. The Executive Committee meets twice a year. Its main aims are to discuss new developments, identify knowledge gaps and implementation barriers, and shape AMF's work program accordingly. ExCo meetings are well attended; on average, 78% of the Contracting Parties and 93% of the Operating Agents participate in ExCo meetings.

The Executive Committee is headed by an ExCo Chair and several Vice-Chairs. The goal is to have a geographically balanced team of Chairs. Also, a Senior Vice-Chair has been appointed to serve as the "institutional memory" of the AMF IA and guide the process of AMF IA asking for extension for another five-year working period.

The AMF IA work program is carried out through Annexes, which are projects with defined objectives, a defined work scope, and defined starting and ending dates.

Annexes are designed to meet at least one of AMF's three strategic objectives:

1. Information dissemination and membership,
2. Cooperative R&D, and
3. Markets and deployment.

All Delegates are encouraged to propose topics for new Annexes. Whenever three contracting parties support a proposal and sufficient funding is raised, a new Annex can be established. This system allows for flexible adaptation of the annual work program, for continuous development of AMF's scope, and for reacting to any technology gaps or market barriers that have been identified.

To help the Executive Committee establish appropriate Annexes, three subcommittees were installed (one in May 2009 and the others in the current 2009–2015 working period), focused on (1) strategy, (2) technology, and (3) outreach. The subcommittees regularly review and, as needed, develop and revise AMF's strategy, provide new stimuli to encourage technology development, and encourage the participation of new members. Each subcommittee is headed by one of the experts within the AMF Executive Committee, who leads discussions in the subcommittee and coordinates the activities of its members.

For each Annex, an Operating Agent is appointed; this person is responsible for ensuring that the activities of the Annex are carried out, reporting to the Executive Committee, and delivering a final report.

Operating Agents provide progress reports on their Annex at each ExCo meeting. Annex reporting was streamlined during the course of this working period. A regular progress report covers the project's background, scope, and schedule as well as proposed changes/actions and decisions that need to be made. Including information on the data that were generated and the conclusions that were reached in the data assessment is optional. Nevertheless, Operating

Agents often make use of the opportunity provided by these meetings to engage all Delegates in topical discussions. When an Annex is closing, the Operating Agent provides a major report on it to the Executive Committee; this report expands on the data, results, and key messages of the Annex.

Information exchange during ExCo meetings is enhanced through presentations by the hosting country, regional overviews, presentations by observers, updates from the IEA Energy Technology Network (ETN), and site visits. In addition, occasionally, workshops or conference sessions are organized to run along with the ExCo meetings to facilitate information exchange between AMF experts and others.

National Delegates from each country that participates are encouraged to set up national networks and to forward any relevant information to the network members. Often national Delegates are well-known experts in their fields of expertise and serve as advisors to national policy makers. Relevant information may include summaries of ExCo meetings, findings from Annex work, links to the Annex reports, and the quarterly AMF newsletter.

The AMF website (www.iea-amf.org) serves as the main platform for presenting AMF activities and publications. A special feature of the website is the AMF Fuel Information System; this subsection provides a wealth of information on end-use-related aspects of advanced motor fuels.

Day-to-day administration of the AMF Implementing Agreement is carried out by a Secretary, who is appointed by the Executive Committee and paid from the common fund (established from the membership fees). The Secretary is the first point of contact for the Operating Agents of the different AMF Annexes and for the IEA Secretariat (with regard to administrative issues) as well. The Secretary also helps the Executive Committee, especially in arranging ExCo meetings and drafting reports. It is the Secretary who ensures that the IEA's framework for IAs is followed and that Delegates and Operating Agents are aware of relevant rules.

The legal text of the AMF IA was revised twice during the reporting period. In June 2012, it was revised to reflect that written procedures could also be submitted by email and to change both the number of annual reports that had to be submitted to the IEA Secretariat and the timing of the submission. In July 2013, it was revised again to cover how the legal text applies to sponsors, how many contracting parties are needed to start an Annex, and how often ExCo Chairs are to be elected. At the ExCo meeting in May 2013, "Terms and Conditions for Sponsors" were defined in order to provide guidance on how to deal with participants who participate not on behalf of a national government (contracting party) but on behalf of their own company. All of these issues were raised and discussed at several ExCo meetings, and the respective decisions were unanimous, made either directly at the meeting or after it by written procedure.

The common fund is established from the annual membership fees of all contracting parties (9,500 € [$13,009 US] per year). It is managed by a financial officer, who ensures that the money is used as decided by the unanimous decisions of the Executive Committee. The common fund is used to pay for the Secretary, to finance the Annex on Information Exchange, to contribute to Annexes of common interest, to fund the travel of the ExCo Chair to and from conferences, to prepare an enhanced Annual Report, and other activities. Every year at the

second ExCo meeting, the budget for the upcoming year is discussed and determined by a unanimous decision of the ExCo Delegates.

The AMF Annual Report was significantly enhanced during the 2009–1014 working period. Now, all country Delegates and all Operating Agents are expected to provide their contributions based on a predefined template. Country reports include data on the production and use of alternative fuels, fuel infrastructure, and policies and legislation that are either in place or planned, as well as an outlook and references. Annex reports cover project background, scope, objectives, activities, results, deliverables, and future plans. These contributions are accompanied by information on the AMF IA, summaries of ExCo meetings, a global overview on transport energy demand, and a message from the ExCo Chairperson. All contributions are being edited by a team at Argonne National Laboratory, put in a common layout, and printed as a book. The 2010, 2011, and 2012 editions have already been prepared in this way (Figure 3). The books serve as a major tool for outreach; some 600 hard copies are printed and distributed not only to members of AMF but also to participants at transport-related conferences.

FIGURE 3 Past Editions of AMF IA Annual Reports

CONTRIBUTION OF AMF IA TO TECHNOLOGY EVOLUTION/PROGRESS AND TO TECHNOLOGY DEPLOYMENT/MARKET FACILITATION

The AMF IA supports the evolution of technologies through Annexes that conduct and provide results from basic and pre-competitive research and that develop and standardize methodologies. The deployment of technologies is supported by AMF Annexes that evaluate or verify the performance of various fuel and powertrain options and those that provide an overview on existing technologies. Annex 28, dedicated to information dissemination, ensures that Annex results are made publicly available and that messages are conveyed to specific target groups. By making unbiased, solid data on fuels and powertrains publicly available, AMF significantly supports technology evolution and deployment worldwide.

Success stories of AMF contributions to technology evolution include these:

- Annex 33 contributed to basic research on particle emissions of small two-stroke engines and clarified reduction measures.
- Annex 35 found that high-level ethanol-blended fuels result in the most efficient engines and least emissions and explored their impacts on particle emissions.
- Annex 36 provided the scientific base for measurement methodologies and standards for ethanol-fueled vehicles.
- Annex 39 opened up the process for engines using dual-fuel technology to be included in the scheme for UNECE/EV emission-type approvals (EURO VI).

Success stories of AMF contributions to technology deployment include these:

- Annex 37 provided a solid base for choosing technologies and fuels for city buses.
- Annex 43 evaluated the performance of light-duty vehicles using various fuels and powertrains.
- Annex 49 is evaluating the performance of commercial vehicles.

Table 8 illustrates the focus of individual Annexes.

TABLE 8 Focus of AMF Annexes

Annex	Title	Basic Research	Precompetitive Research	Methodology Development	Performance Evaluation/ Verification	Overview Reports	Information Dissemination
28	Information Service & AMF Website (AMFI)						X
33	Particle Emissions of 2-S Scooters	X					
34-1	Analysis of Biodiesel Options					X	
34-2	Algae as a Feedstock for Biofuels					X	
35-1	Ethanol as a Fuel for Road Transportation					X	
35-2	Particle Measurements: Ethanol and Butanol in DISI Engines				X		
36	Measurement Technologies for Emissions from Ethanol Fuelled Vehicles – METEV			X			
37	Fuel and Technology Alternatives for Buses				X		
38	Environmental Impact of Biodiesel Vehicles				X		
39	Enhanced Emission Performance and Fuel Efficiency for HD Methane Engines				X		
40	Life Cycle Analysis of Transportation Fuel Pathways			X			
41	Alternative Fuels for Marine Applications – Future Marine Fuels Study					X	
42	Toxicity of Exhaust Gases and Particles from IC-Engines – International Activities Survey			X			X
43	Performance Evaluation of Passenger Car Fuel and Powerplant Options				X		
44	Research on Unregulated Pollutants Emissions of Vehicles Fuelled with Alcohol Alternative Fuels			X			
45	Synthesis, Characterization and Use of Hydro Treated Oils and Fats for Engine Operation				X		

TABLE 8 (Cont.)

Annex	Title	Basic Research	Precompetitive Research	Methodology Development	Performance Evaluation/ Verification	Overview Reports	Information Dissemination
46	Alcohol Application in CI Engines		X				
47	Reconsideration of DME Fuel Specifications for Vehicles			X			
48	Value Proposition Study on Natural Gas Pathways for Road Vehicles					X	
49	COMVEC – Fuel and Technology Alternatives for Commercial Vehicles				X		
50	Fuel and Technology Alternatives in Non-Road Engines	X			X	X	X
51	Methane Emission Control		X		X		X

AMF'S RELEVANCE TO POLICY MAKING

It is natural that any country participating in the AMF IA regards policies on advanced motor fuels as important. The reasons that a country might feel this way include the need to import large amounts of fossil fuel (most European countries), forecasts that traffic volumes will rapidly increase (China), and problems with local air pollution caused by the transportation sector (Chile). Several AMF ExCo members directly advise their governments on transport-related issues, which means that the results derived from Annex work are used in making national and transnational policies. Some success stories related to these results follow here:

- Finland: Annex 43 results were used to set objectives and recommendations for passenger cars transport.
- Japan: Annex 38 results were used to prepare appropriate policies for introducing biodiesel fuel and vehicles into the Japanese market.
- Sweden: Annex 39 results were used to support the Swedish Commission on Fossil-Free Road Transport with respect to heavy-duty methane-fueled vehicles.
- European Commission: Annex 36 results provided the basis for further investigations of ethanol blends and related standards.
- UNECE (United Nations Economic Commission for Europe): Annex 39 results were used to enable the homologation of dual-fuel engines within the Euro VI regulation.

Several Annexes produced overviews of existing technologies and thus provide a sound basis for policy decisions. Annex reports include an executive summary for easy identification of key findings. Examples include Annexes 34 (biodiesel, algae), 35 (ethanol), 40 (life-cycle analysis), and 41 (marine fuels). Results from performance evaluations of various fuels and powertrains (Annexes 37, 43, and 49) also support national policy making. Moreover, the AMF website, especially through the Fuel Information System subsection it includes, provides a wealth of information to decision makers. This information is regularly updated reviewed through a diverse team of reviewers.

The AMF Strategy Subcommittee is working to further enhance the relevance of AMF work to policy making. Several discussions during ExCo meetings were dedicated to highlighting relevant areas for each of the members, and in September 2013, a questionnaire was sent out and completed by all AMF members to identify areas of common interest.

Results of the September 2013 Survey

Many fuels are being used around the world, but which will be winners over the long haul? Some fuels of interest are natural gas, ethanol, and BTL/HVO (biomass-to-liquid/hydrotreated vegetable oil). Although they are not widely used now, BTL/HVO and E85 (blend of 85% ethanol in gasoline) are seen as prospective fuels.

To the question, "Whom should AMF address?" there was a clear answer: policy makers and researchers. Researchers were an obvious choice since information exchange is already an important part of AMF collaborations and should continue to be. But there was also a strong opinion that AMF should provide technology policy advice. The same conclusion can be drawn from the replies to the question, "Which of the objectives should be kept, and on which objectives should there be a stronger focus?"

In addition, a stronger involvement by industry was strongly encouraged by survey respondents (83%), as was further cooperation within the Energy Technology Network (ETN), especially with the Bioenergy, Combustion, and HEV IAs.

AMF'S CONTRIBUTION TO ENVIRONMENTAL PROTECTION

AMF work collates and often even generates data on the environmental effects of alternative fuels and powertrains. The results are published, regardless of the nature of these effects (positive or negative). This allows policy makers to address environmental concerns adequately and to make informed decisions.

Examples include these:

- Annex 38 has been measuring real-world driving emissions from biodiesel-driven vehicles.
- Annex 39 showed that some technologies for dual-fuel operation have higher levels of methane emissions than anticipated.
- Annex 40 showed what answers can and cannot be supplied by life-cycle analyses of transportation fuels.
- Annex 42 is helping to disseminate information on health effects and raise both the public's and the scientific community's consciousness of them.

AMF is an unbiased source, not driven by any interest to favor one fuel or technology over another.

AMF'S CONTRIBUTION TO INFORMATION DISSEMINATION

AMF Annex 28 is dedicated to information dissemination, and its activities cover the AMF website, the quarterly newsletter, and the AMF Fuel Information System.

The AMF website (www.iea-amf.org) provides information about the AMF IA and the work done in its Annexes. The final reports of all Annexes are published on the website, and links are provided to published scientific papers that are based on AMF Annex results. The website receives significant traffic (some 9,000 site visits per year) and is well received in most of the countries of the world (see Table 9).

The AMF quarterly newsletter provides news articles on transport-related policies and research, as well as links to relevant publications and events. It is distributed to all AMF Delegates and Operating Agents, to nine other transport-related IAs, and to more than 40 experts who subscribe to it. In addition, national Delegates (i.e., the ExCo Delegates of each member country) distribute the newsletter in their own national networks; recipients include experts in industry, academia, and policy making areas.

The most significant output from the AMF work done in the period 2009–2015 is the AMF Fuel Information System. It focuses on the end-use aspects of advanced motor fuels, including their effects on car performance and emissions and the compatibility of the fuels with the fuel infrastructure. When the end-use aspects are being evaluated, the complexities associated with engine/after-treatment options, uncertainties within measurement methods, and incomparable components considered in different measurement campaigns are taken into account. The aim of the AMF Fuel Information System is to provide easy access to all end-use-related information related to advanced motor fuels. It is integrated into the AMF website, as can be seen in Figure 4.

TABLE 9 Number of Visits to AMF Website by Country (1 June 2013 through 31 May 2014)

Country	Visits	Country	Visits	Country	Visits	Country	Visits
United States	1867	Romania	51	Iceland	8	Nepal	2
United Kingdom	664	Russia	48	Kosovo	8	Togo	2
India	639	Egypt	46	Bosnia and Herzegovina	7	Afghanistan	1
Finland	467	Hungary	44	Benin	7	Bolivia	1
Austria	440	(not set)	43	Belarus	7	Bahamas	1
Germany	410	Ireland	40	Jamaica	7	Bhutan	1
Canada	389	Czech Republic	36	Kazakhstan	7	Botswana	1
Australia	321	Uruguay	36	Puerto Rico	7	Congo (Republic)	1
Sweden	254	Hong Kong	35	Sudan	7	Cameroon	1
France	244	Ukraine	34	Venezuela	7	Dominica	1
Denmark	209	Bulgaria	33	Lebanon	6	Guernsey	1
Thailand	193	Iraq	32	Morocco	6	Gambia	1
Italy	189	Serbia	30	Mauritius	6	Honduras	1
Poland	175	Zimbabwe	30	Cyprus	5	Isle of Man	1
Malaysia	168	United Arab Emirates	29	Ecuador	5	Jersey	1
Spain	155	Saudi Arabia	29	Georgia	5	Kyrgyzstan	1
Japan	154	Colombia	28	Azerbaijan	4	Libya	1
Netherlands	150	Lithuania	27	Costa Rica	4	Northern Mariana Islands	1
South Korea	148	Argentina	26	Dominican Republic	4	Réunion	1
Switzerland	137	Croatia	23	Moldova	4	Sierra Leone	1
Chile	135	Ghana	22	Panama	4	Senegal	1
China	131	Peru	22	Tanzania	4	São Tomé and Príncipe	1
Brazil	119	Slovakia	19	Armenia	3	El Salvador	1
South Africa	113	Tunisia	15	Belize	3	St. Vincent & Grenadines	1
Philippines	105	Trinidad and Tobago	15	Guatemala	3	Yemen	1
Turkey	102	Côte d'Ivoire	14	Cambodia	3		
Indonesia	94	Sri Lanka	14	Myanmar (Burma)	3	Total	10229
Israel	79	Estonia	13	Palestine	3		
Belgium	75	Slovenia	13	Suriname	3		
Singapore	69	Bangladesh	11	Syria	3		
Norway	68	Ethiopia	11	Chad	3		
Taiwan	66	Jordan	11	Angola	2		
Portugal	64	Mongolia	11	Aruba	2		
Pakistan	63	Malta	11	Bahrain	2		
Vietnam	62	Kenya	10	Algeria	2		
Greece	61	Luxembourg	10	Gabon	2		
Mexico	60	Macedonia (FYROM)	10	Guyana	2		
Iran	59	Albania	9	Laos	2		
Nigeria	54	Kuwait	9	Montenegro	2		
Latvia	53	Oman	9	Mali	2		
New Zealand	53	Qatar	9	Macau	2		

FIGURE 4 Screen Shot of Fuel Information System on the AMF Website

Other information dissemination efforts include the preparation of the AMF Annual Report (which provides country reports and Annex reports), participation in conferences, and publication of Annex final reports and scientific papers resulting from Annex work. Some of the Annex Final Reports, as well as the Annual Report, are printed and widely distributed. In 2012, 500 USB devices, with the AMF logo on them, were produced and handed out at workshops and conferences. They contained the current AMF Annual Report, several Annex Reports, presentations made by AMF Delegates, and information about the AMF Implementing Agreement.

Conference and Workshop Contributions

- IEA Bioenergy Task 39 Workshop, June 2–5, 2009, Dresden, Germany:
  Trends for Future Vehicle Powertrains: Enabling the Use of Renewable Energy
  (Nils-Olof Nylund)
- 56th IEA WPFF Meeting, June 5, 2009, Ostrava, Czech Republic:
  Trends for Alternative Energies and Vehicles in the Road Transport Sector
  (Nils-Olof Nylund)
- 8th World Congress of Chemical Engineering, August 24, 2009, Montreal, Canada:
  IEA-AMF: Fuel and Technology Alternatives for Buses (Jean-Francois Gagne)

Conference and Workshop Contributions (Cont.)

- Transportation Technologies and Fuels Forum, October 27, 2009, Washington, D.C.:
  International Energy Agency Working Party on Efficient End-Use Technologies Transportation Related Implementing Agreements (Jean-Francois Gagne)
- Transportation Technologies and Fuels Forum, May 10, 2010, Ottawa, Canada:
  IEA Transport Contact Group (Nils-Olof Nylund)
- KorUS Workshop on Green Car Collaboration, September 28, 2011, Chonan, Korea:
  IEA-Advanced Motor Fuels Implementing Agreement (Larry R. Johnson)
- SAE 2012 Commercial Vehicle Engineering Congress, October 2–3, 2012, Rosemont, Illinois:
  IEA Technology Network Cooperation: Fuel and Technology Alternatives for Buses, Overall Energy Efficiency and Emission Performance (Nils-Olof Nylund)
- IEA Bioenergy Workshop Future Biomass-Based Transport Fuels, October 5, 2011, Helsinki, Finland:
  Biofuels End-Use Aspects: Maximizing Impact and Performance (Nils-Olof Nylund)
- 19th International Symposium on Alcohol Fuels, October 10–14, 2011, Verona, Italy:
  How to Design Appropriate Incentives (Olle Hådell)
- ANGVA 2011, October 18, 2011, Beijing, China:
  International Energy Agency Work on Natural Gas as a Transportation Fuel
  (Jean Francois Gagné)
- TransEco Bus Seminar, February 6, 2012, Helsinki, Finland:
  Fuel and Technology Alternatives for Buses. Overall Energy Efficiency and Emission Performance, IEA AMF Annex XXXVII & Bioenergy Task 41/Project 3
  (Nils-Olof Nylund)
- 19th International Symposium on Alcohol Fuels, October 10–14, 2012, Verona, Italy:
  Benchmarking HD Ethanol Vehicles against Diesel and CNG Vehicles (Nils-Olof Nylund)
- NGV Global 2012, 13th Global Biennial Conference and Exhibition,
  November 6–10, 2012, Mexico City, Mexico:
  IEA Energy Technology Network, AMF Activities on Methane Vehicles
  (Nils-Olof Nylund)
- IEA Workshop on Integrated Approaches to Energy Technologies, Network of Experts in Energy Technology (NEET), November 27, 2012, Beijing, China:
  Reducing Particle Emissions: The Growing Demand for Alternative Fuels
  (Nils-Olof Nylund)
- Eco-Mobility 2012, December 11–12, 2012, Vienna, Austria:
  Advanced Motor Fuels (Dina Bacovsky)
- 20th International Symposium on Alcohol Fuels, March 25–27, 2013, Stellenbosch, Cape Town, South Africa:
  Alcohol Fuels for On-Road Transport (Debbie Rosenblatt and Päivi Aakko-Saksa)

Conference and Workshop Contributions (Cont.)

- Kazenergy Eurasian Forum, October 8-9, 2013, Astana, Kazakhstan:
  Advanced Motor Fuels and Efficient Energy End-Use Technologies: The Key to a Decarbonized Energy System (Sandra Hermle)
- IEA Bioenergy Workshop Infrastructure Compatible Transport Fuels, May 20, 2014, Copenhagen, Denmark:
  Fossil Free Road Transport? Trends and Ideas in Sweden (Olle Hadell)
  Transport Technology Options (Nils-Olof Nylund)
  Biofuels in Spark-Ignited Engines (Jesper Schramm)
  Light-Duty Vehicles (Jukka Nuottimäki)

OUTREACH TO IEA NON-MEMBER COUNTRIES

The IEA is made up of 29 member countries (see http://www.iea.org/countries/ for a list), all of which are also OECD countries. Yet, just over half of the world's energy consumption and almost all the growth in energy demand up to 2030 are taking place outside the IEA region, which is why outreach to IEA non-member countries (partner countries) is a must.

In order to coordinate AMF´s outreach to other countries, the AMF ExCo installed an outreach subcommittee in 2009. It actively seeks to attract new members to AMF, with a focus on countries forecasted to have rapidly increasing volumes of traffic (e.g., China, India) or experience severe problems with air pollution from transport (e.g., Mexico). There is significant congruence between IEA and AMF target countries.

The AMF outreach subcommittee actively contacts relevant ministries in the target countries, informs them about AMF's goals and work program via email, and invites them to participate in ExCo meetings as observers.

This effort has been quite successful. China, Israel, and Thailand became active members of AMF and contribute to several Annexes each. More recently, the focus has been on Latin America. Chile hosted an ExCo meeting at which Uruguay and Brazil attended as observers. Communications with other non-member countries, including India, Indonesia, Russia, and, most recently, Kazakhstan, are ongoing.

THE "ADDED VALUE" OF AMF IA WORK

Truly good international cooperation adds value to any individual or national work. And AMF is a neutral and thus credible platform for international cooperation on transportation fuels. The robust data generated by AMF can be used as a basis for decision making by governments as well as private companies.

AMF membership currently comprises 16 countries from three continents: Asia, Europe, and North America. Three members are non-IEA countries: China, Israel, and Thailand. The various countries have significantly different local conditions in which alternative motor fuels can be deployed, not only in terms of their available fuel feedstocks, processing capabilities, fuel standards, and exhaust emission regulations but also in terms of their policies on alternative fuels. AMF takes these different regional conditions into account in its work. And the non-IEA countries are bringing new fuel options and new aspects of alternative fuel deployment to the table for discussion and possible R&D and deployment.

To enhance its operations, AMF has established three subcommittees: Outreach (with a focus on membership and adequate regional representation), Strategy (with a focus on overarching issues), and Technology. Technology is the latest addition. The subcommittees enable discussions on specific subjects at a level of detail that is not possible at a full ExCo meeting. These subcommittees are open to all interested AMF participants. They allow for the formation of smaller and more homogeneous groups of experts, who have common backgrounds and objectives. And all the subcommittees contribute to the management and guidance of AMF, including providing input for strategic plans and for end of term reports, like this one.

AMF has power: the power to initiate new activities and to generate new data, through projects involving cost sharing, task sharing, or a combination of both. When AMF activities are cost-shared, AMF can react more quickly to new developments, if necessary. And both top-down and bottom-up approaches to defining new Annexes can be employed in AMF.

Industries can participate with AMF in several ways. For example, in the case of France, Italy, and Thailand, the national governments have designated companies to serve as Delegates or alternates to the Executive Committee. Another option is for companies to participate at the Annex (project) level. A third option is to be a sponsor.

Over the years, AMF has had several Annexes that have developed testing and assessment methodologies and Annexes that have provided solid, unbiased data on vehicle and fuel performance. Recently, several research laboratories have teamed up in Annexes to use a common protocol for generating performance data. By so doing, they have added value to national activities as a result of their use of pooled test facilities and data. Coordinated efforts make it possible to avoid useless duplication and also enable a leveraging of investments on a certain topic.

AMF's work has had an impact on national policies on transportation fuels and on industrial decisions. An example of this occurred in Finland and Sweden, as described in the policy relevance section of this report (see first and third bullets). Comprehensive work on technology and fuel options for buses, done by the AMF IA working with the Bioenergy IA and involving the participation of nine countries plus the European Commission, has guided the procurements of buses and bus services in many places around the world.

All the examples mentioned here underscore the added value of the AMF IA in providing first-hand, unbiased information on advanced motor fuels and transportation-related issues.