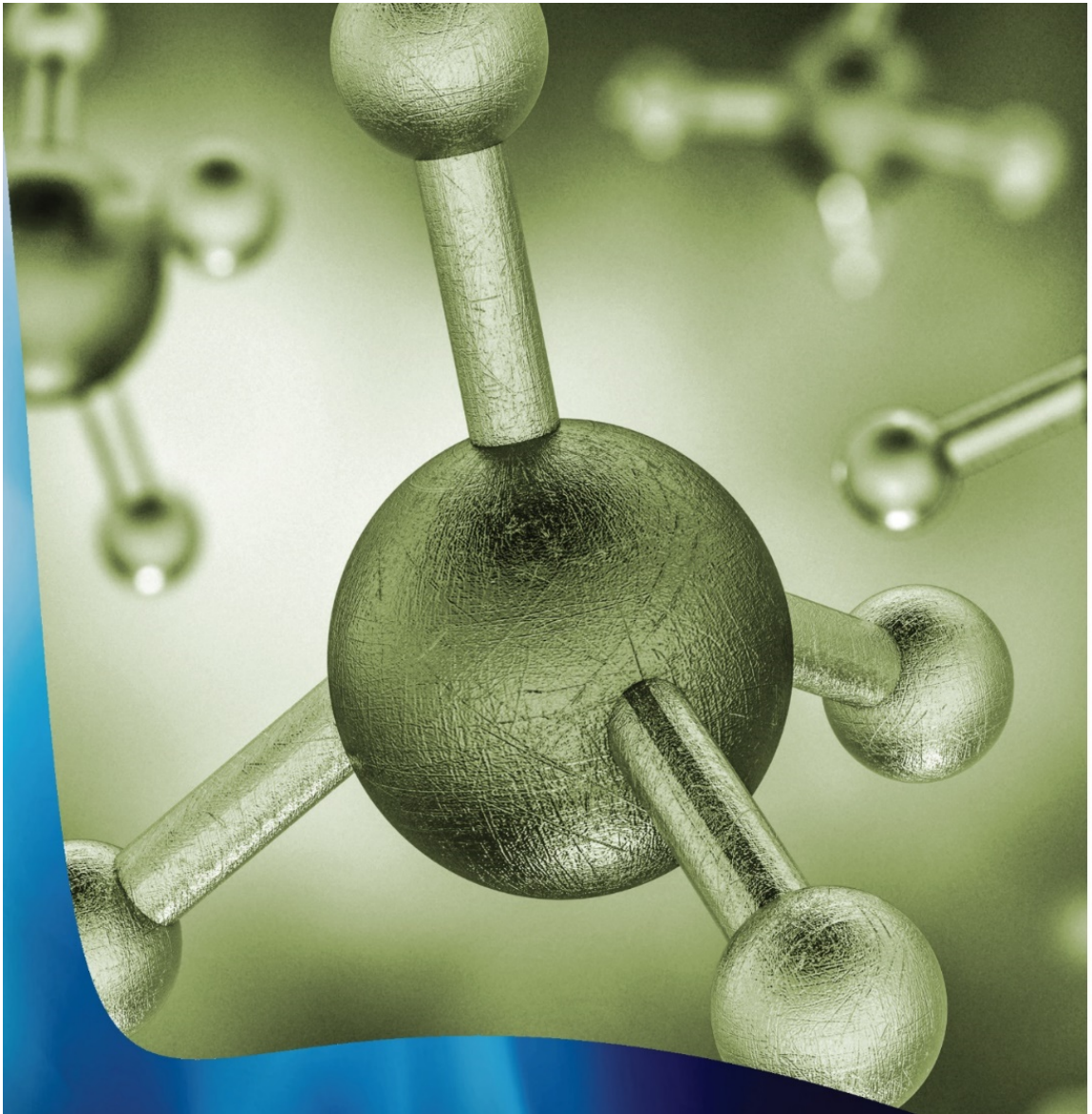

Methane Emissions ACTION PLAN

Coordinated by gie and marcogaz

Background

This action plan has been developed collaboratively by representatives from the entire gas chain. It shows the actions and projects defined by the gas industry to tackle the identified challenges and gaps in the report "Potential ways the gas industry can contribute to the reduction of methane emissions" (Link - see table 3). The action list will be updated on frequent basis. Should you have updated information to be included and/or any question, please do not hesitate to contact GIE (gie@gie.eu) and/or MARCOGAZ (marcogaz@marcogaz.org).

Closed actions are highlighted in light-green and new or modified actions are highlighted in light-blue.

Contents

Awareness and knowledge on methane emissions

	Actions	Who?	Timing	Deliverables
1	Educational toolkit on methane emissions	MGP[1]	Ready / 2019	Toolkit (a set of recommended Guides, Synopses and Tools, which support the uptake and implementation of the Reducing Methane Emissions: Best Practices) – Link
2	Educational Outreach Programme	MGP	Ongoing	MGP Educational programmes and training sessions – Link
3.a	Dissemination activities and training programmes	GIE MARCOGAZ	Ongoing	Dissemination activities in 2019 • Publication of the report + Press release • Leaflet/brochure on CH_4 emissions • IGU Transmission and LNG Committees (3rd September in Korea) • MEDGIO Meeting (25th September in Amman) • Gas Naturally WS on CH_4 emissions (5th November in Brussels) • EGATEC 2019 (6-8 of November in Groningen) Training Programme in 2019 • GIE&MARCOGAZ WS in Vienna (26-27 November) – Organised together with Energy Community and with the MGP Activities in 2020 • IGU IGRC 2020 (24-26 February, Oman) – Abstract accepted • GMI - Global Methane Challenge – GIE &MARCOGAZ (link) • GIE/MARCOGAZ/Energy Community sessions (16th June / 3rd December) • Gas industry meeting (18th November) • Workshop on LDAR programmes (25th November)
3.b		IOGP	Ongoing	• Workshop on upstream methane emissions (20th February)
3.c		IPIECA	Ongoing	• Workshop on methane science, regulations, voluntary initiatives and global expectations (2nd of November)
4	Global Methane Alliance (Link)	UNEP OGCI	Ongoing	Provide knowledge sharing and technical support to countries that include methane reduction targets from the oil and gas sector in their revised NDCs. Countries that join the Alliance commit to either a "near zero" methane intensity target, or a 45% reduction by 2025 and 60% to 75% reduction by 2030.

[1] Methane Guiding Principles:
https://methaneguidingprinciples.org/

	Actions	Who?	Timing	Deliverables
5	OGCI engagement in downstream activities in collaboration with the MGPs	OGCI	Ongoing	
6	Measurement studies outside of onshore US, emission factors, verification of standards, best practices, technology	IPIECA	Ongoing	"IPIECA Methane Map"
44	Once gas companies establish reduction targets, to evaluate the possibility to set up incentives for the employees			Many companies have integrated the methane emissions reductions in their daily activities and as part of their culture at all the levels of the company.
45	Gas companies to establish a methane emissions reduction culture			

Fragmented initiatives along the gas value chain and lack of harmonisation

	Actions	Who?	Timing	Deliverables
7	Gas operators seeking guidance to address methane emission reduction and urge the associations to take an active role in the global initiatives		Ongoing	- GIE, MARCOGAZ, IPIECA, IOGP, IGU, Eurogas and the Energy Community Secretariat had joint the MGPs as Supporting Organisations. - Industry meetings
8	Aggregation of methane emissions data along the EU gas value chain (including units)	MARCOGAZ IOGP	Ongoing	TBD
9	Oil & gas producers to explore possible methodologies related to the proper allocation of	IOGP	Ongoing	TBD

	Actions	Who?	Timing	Deliverables
	methane emissions to oil & gas chains			
10	Harmonised definitions for the entire gas value chain	MARCOGAZ GIE IPIECA IOGP	Ongoing	Set of definitions for the entire gas value chain - EU gas associations to collaborate based on the IPIECA Glossary

MRV-IV (Monitoring, Reporting, Verification - Integrity and Validation)

	Actions	Who?	Timing	Deliverables
11.a	Methane emissions reporting framework (OGMP 2.0)	CCAC UNEP EDF EC Industry[2]	2020-2021	Methane emissions reporting framework
11.b	OGMP 2.0 – Technical Guidance Documents	CCAC UNEP EDF EC Industry	2020-2021	Technical guidance documents will be updated and completed (link)
12	"Oil and gas industry guidance on voluntary sustainability reporting"	IOGP API IPIECA	Ready / March 2020	IPIECA-API-IOGP - Sustainability Reporting Guidance (Link)
13	Methane reporting comparison study for upstream (UK, Norway, NL, US, Australia): compare monitoring and reporting	IOGP	Ready / February 2020	IOGP Report "Comparison of Methane Reporting Requirements" (Link)

[2] GIE and MARCOGAZ were involved in this initiative until it was officially launched

	Actions	Who?	Timing	Deliverables
	methodologies and emission factors			
30	"Assessment of methane emissions for gas transmission and distribution system operators"	MARCOGAZ	Ready/Nov 2019	GERG Methane Emission Estimation Method for the Gas Distribution Grid (MEEM) project, 2018 Guideline, 2019 (link) CEN TC 234 WG14 working with MARCOGAZ to bring this document into a CEN Technical Report
14	Update MARCOGAZ' methane reporting template according to the "Assessment of methane emissions for Gas Transmission & Distribution System Operators" (Link)	MARCOGAZ	2020	Methane emissions reporting template[3] (link) and technical guide (link) for transmission, distribution, LNG regasification terminals and underground gas storages
15	Improve accuracy and transparency of national inventories[4] - Coordination between the gas industry and national authorities to improve quality of data	MARCOGAZ	2020-2021	A recommendation to be circulated among GIE, MARCOGAZ, IOGP, CEDEC, Eurogas, GEODE's members and the Energy Community Contracting Parties
16.a	Improve accuracy and transparency of national inventories - To explore how NIR could be based on Tier 3 approach for the entire gas chain in the future	MARCOGAZ	2020-2021	A recommendation to be circulated among GIE, MARCOGAZ, IOGP, CEDEC, Eurogas, GEODE's members and the Energy Community Contracting Parties

[3] This action is aligned with action 11 – OGMP 2.0 methane emissions reporting framework.

[4] OGMP 2.0 methane emissions reporting framework will also contribute to improve the accuracy and transparency of NIR

	Actions	Who?	Timing	Deliverables
16.b	Improve accuracy and transparency of data	GERG	TBD	- Application of appropriate statistically valid corrections to direct measurements thanks to an analysis of leak distribution and emissions sources & measurement uncertainties. - Understand, list and characterize measurement uncertainties of existing and evolving technologies for measuring emissions. - Set up an EU data base of sufficiently well characterised measurements to enable a better capitalisation of efforts and allow effective EF updating mechanisms
25	Project: measurement + modelling of impact of LNG carriers (not gas fuelled ships): - All emissions included across all phases of LNG shipping operations. - Pilot study. - 4 Work Packages defined. Methane slips from engines included	CAMS Enagás SIGTTO (Supported by academia)	2021	Report
55	Global Gas Flaring Explorer	OGCI Payne Institute (Colorado School of Mines) & the World Bank's Global Gas Flaring Reduction Partnership (GGFR).	Ongoing, deliverables expected throughout 2021 and 2022	The Global Gas Flaring Explorer project will, through the development of a transparent web platform, deliver real-time and improved monitoring, mapping, visibility and transparency of gas flaring data at oil production sites around the world. The tracking of flare volumes over time will improve the ability to monitor and demonstrate progress towards the World Bank's Zero Routine Flaring by 2030 initiative, which OGCI advocates for and supports.

Technologies to detect, measure and quantify / Data accuracy & reconciliation

	Actions	Who?	Timing	Deliverables
17	Global Methane Science Studies	Part of the CCAC coalition UNEP EDF OGCI EC	Ongoing. Different dates for each deliverable	Academic papers
22	Collection of the data to the IOGP EPI Report edition 2020	IOGP	Ready / November 2020	Report "Environmental performance indicators" (link)
28	Project: Assessment of existing tools/equipment's for detection of CH_4 for TSO in transmission networks	GERG (project leader Gaz-System)	Ready / September 2020	Recommendations for TSO's
29	Project "ME TSO" (Germany): New emission factors (EF) and activity factors (AF) determination for valve stations and compressors stations (= 2 priorities that are emitting the more). Top Down Methodology	FNBGas	"AF": finished "EF": 2020/2021 Top down: 2021	Figures on emission factors Measurements with a drone. Data reconciliation with bottom-up technologies
31	Quantifying underground leakages measurements in gas distribution networks	GERG (project leader KIWA)	Ongoing (ready before end 2020)	Report

	Actions	Who?	Timing	Deliverables
32	Project "ME DSO": New emission factors (EF) and activity factors (AF) determination for pipelines and gas pressure regulating facilities. Only for German cases (but could be open for other EU countries).	DVGW DBI	From 8/2018 to 2022	Report + Figures on emission factors
33	Project "ME-Red DSO": Guidelines for DSO operators for reducing CH_4 emissions from distribution grids in Germany.	DVGW DBI	Ready	Guidelines for DSO operators (link – only in German)
54	Project on Top Down Methodologies (Midstream)	GERG (project leaders GRT-gaz / Enagás)	2021	Phase I – Analysis of the state of the art of the methodologies (mid and downstream segments) Phase II - Development of tests and guidelines. Top-down and bottom-up data reconciliation (midstream) This project has strong industry buy-in both for Transmission, Storage, LNG terminals and Distribution sectors.
34	Joint initiative from associations to support coherent measurement campaigns by DSOs at the national and regional level to continuously improve data availability and quality	CEDEC Eurogas Geode	Ongoing	First projects (to be) set up in DE, AT, BE, NL + additional data availability
35	Project "EvEmBi" (biomethane): - Evaluation of biogas plant concepts concerning methane emissions - Estimation of emission factors of whole biogas plant inventory in the participating countries	EBA (lead is DBFZ)	Ongoing	EBA workshop on EvEmBi project in January 2020 (Link) "Methane emission mitigation strategies - information sheet for biogas industry" (Link) "Minimum requirement for European voluntary systems for self and external inspection of possible methane emission on biogas and biomethane plants" (Link)

	Actions	Who?	Timing	Deliverables
	- Implementation of emissions mitigation measures - Cost-Benefit-Analysis (for single mitigation measures) Transfer of knowledge (workshops, position papers, voluntary systems)			Workshop planned in January 2021.
56	Development of a methane emissions research roadmap	GERG	Ongoing	Roadmap on methane emissions research needs and priorities, incorporating mapping of existing local global initiatives and developing a sector by sector R&D action plan for estimation, measurement and mitigation.
57	Project to develop industry recommended practices for deploying methane detection and quantification technologies	IOGP IPIECA OGCI	Ongoing Kick-off September 2020) Completion of Phase 1 expected for Q2 2021	Develop a set of recommended industry practices on how best to deploy new and established detection and quantification technologies to reduce methane emissions. First phase - Detection Second phase - Quantification
58	OGMP 2.0: Uncertainty and data reconciliation guidance	CCAC UNEP EDF EC Industry	2021	Step by step guidance
48.a	OGCI Climate Investment fund investment on technologies supporting “Towards zero methane emissions”	OGCI-CI	Ongoing	6 Investments in the methane space to date (OGCI, 2020)

	Actions	Who?	Timing	Deliverables
48.b	OGCI Climate Call for investments for projects to reduce methane emissions	OGCI-CI	June to September 2020	programme to finance or invest in projects around the world that delivered significant near-term impact in CH4 emission reduction by deploying proven methods and technologies. Over 80 applications from 13 countries received (link))
59	Identify key methodologies to identify, detect, measure and quantify methane emissions	MGP Supported by GIE, MARCOGAZ and Eurogas	September 2020	Best practice guide on identification, detection, measurement and quantification (link)
60	Methane Emission Detection from Satellite Measurements – Data reconciliation (link)	ESA NPL	Ongoing	Phase 1 – Measurement requirement definition Phase 2 – Satellite capability validation and calibration Phase 3 – Operational review of GHGSat and other satellites
61	Corridor and Asset Monitoring using Earth Observation (CAMEO) project (link)	ESA	Ongoing	This 2 years project aims to boost the understanding and integration of satellite Earth Observation services by companies and agencies managing pipeline and energy transmission corridors
62	Collaboration GHGSat (Iris satellite) with ESA&CSA (link)	ESA CSA GHGSat	Ongoing	The ESA jointly with the CSA announces the opportunity for the scientific exploitation of GHGSAT-C1 ("Iris") Level-2 data. 5% of the capacity of the commercial GHGSat-C1 (Iris) satellite measurements will be made available to the scientific community.
67	KPIs to track detection and quantification campaigns	OGCI	Ongoing	Developing KPIs to track OGCI member companies efforts to deploy emerging and incumbent detection and quantification campaigns in OGCI member companies assets.

Mitigation measures and best practices

	Actions	Who?	Timing	Deliverables
19	Reducing Methane Emissions Best Practice Guides (summary of current known mitigations, costs, and available technologies as at the date of publication)	Methane Guiding Principles	Ready / 2019	Best Practices Guides (Link)
23	"Best practice guidance for effective methane management in the O&G sector: monitoring, reporting, verification and mitigation".	UNECE GMI	Ready / 2019	Report (Link)
26	Proposal for the reduction of methane slips from ships (Link)	SGMF IMO	Ongoing	
27	Guidelines for methane emissions management and mitigation in LNG terminals	GIIGNL	Ongoing / Dec 2020 – January 2021	Guidelines for LNG terminal operators to reduce their emissions The report covers: - Types of methane emissions in LNG terminals - Emission estimation methodologies - Detection and Measurement Technologies - Detection and Measurement Programs - Mitigation measures - Case studies
37	Collaboration between NGOs, industry and academia will lead to further reduction of uncertainty between methodologies (some ongoing CCAC Methane Science Studies,		TBD	

	Actions	Who?	Timing	Deliverables
	but more work in this area is required)			
46	Identify key BATs for transmission, LNG terminals, UGS, Distribution - Analysis and evaluation of the impact of the different BATs	MGP Supported by GIE, MARCOGAZ and Eurogas	September 2020	Best practice guide on reducing methane emissions: Transmission, storage, LNG terminals and distribution (link)
47	Identify key BATs for utilization	MARCOGAZ SC Utilisation EUROMOT (obs) EUTurbines (obs)	TBD	Set of good practices per type of methane emissions
38.a	Gas utilisation: Methane emissions testing /measurement in domestic & commercial appliances, power generation, mobility and industrial use	DGC	2021/2022	Intermediates deliveries + final report
38.b	Gas utilisation: project including on assessment of methane emissions from gas utilisations in Europe	DVGW	2021/2022	Report
39	Road transport: CH_4 emission is included in the validation process of the car (homologation process + during the lifetime of the vehicle)	NGVA	Ongoing	- Heavy Duty legislation (Euro VI) : CH4 tailpipe emissions are directly regulated at 500 mg/kWh - Light Duty legislation (Euro 6): CH4 is indirectly regulated as we have two separate limits on THC (Total unburnt HC) at 100 mg/km and on NMHC (Non Methanic unburnt HC) at 68 mg/km. - EURO 7/VII standards starting from 2025/27 are under development

	Actions	Who?	Timing	Deliverables
40	Dispensing operations on LNG trucks	NGVA	Ongoing	- Procedure for refuelling looking also to minimize the operation of connection/deconnection of the refuelling nozzle (safety reasons but also leakages). - Collecting best practices (e.g. liquid N2 cooling) to realize a “zero venting” station.
41	Gas turbines: - fuel venting: case study - fuel leakages: not a big issue → LDAR Remark: Check how many existing installations can be modified according to the case study.	European Turbine Network	Ongoing, March 2021	Short Report (CCGT Case Study)
63	Technical recommendation on LDAR campaigns	MARCOGAZ	Ongoing (draft report under consultation)	Technical report
64	Technical recommendation on flaring and venting	MARCOGAZ	Ongoing/2021	Technical report

Reduction targets

	Actions	Who?	Timing	Deliverables
42	Guidelines for companies to set emissions reduction targets (from production to distribution)	GIE MARCOGAZ IOGP	April 2020	Guidelines for methane emissions target setting (Link)
43	Evaluation of the establishment of the emission reduction targets per segment at European level	GIE MARCOGAZ CEDEC Eurogas Geode	TBD	

Cross sectorial opportunities and non-EU countries involvement

	Actions	Who?	Timing	Deliverables
49	Cross-sectorial platform bringing together EU sectors responsible for methane emissions	FSR	TBD	Platform, roundtables, workshops, …
50	Enhance the collaboration with non-EU companies (along the complete gas value chain)	TBD	TBD	Platform, roundtables, workshops, …
65	Global Methane Observatory	OGMP 2.0 UNEP EC	Ongoing	

Additional studies and initiatives

	Actions	Who?	Timing	Deliverables
18	"Global methane budget" (sources & sinks)	OGCI sponsoring via the CCAC Partnership	Multiyear program: next one in 2022	Update on the Website, documents, events, feeding directly in the Global Carbon Budget study
20	EC study "Limiting methane emissions in the energy sector"	EC Wood (+TNO, Carbon Limit, Sniffers) Industry	Ongoing /2020	Report
21	Maximizing the abatement of greenhouse gas emissions in the natural gas supply chain	OGCI Imperial College London	2021	Analyze different available technologies applicable to different sectors of the natural gas supply chain to estimate the maximum emissions abatement at a determined cost. Report
24	"OGCI Annual report publication"	OGCI	December 2020	Report (Link)
36	Set up of an Oil & Gas database: "Methane Tracker"	IEA	Already existing. To be expanded	Database (link) and insights (link)
51	Analysis of EU and national regulation, including its impact (gas industry to support this action)	TBD	TBD	
52	Publications and policy briefs on methane emissions	FSR	2019-2020	• "Substantial reduction of methane emissions for achieving the climate goals" – 04/2019 (link) • "Regulatory Framework to Mitigate Methane Emissions in North America. The Lessons Learned for Europe" – 11/2019 (link)

	Actions	Who?	Timing	Deliverables
				• "Methane Emission Reduction – An Important Step in Strengthening the Sustainability Dimension in Gas Network Companies"- 04/2020 (link) • "Fight against methane emissions – the example of Canada" – 05/2020 (link) • "Satellite and Other Aerial Measurements – A Step Change in Methane Emissions Reduction?" – 08/2020 (link) • "EU takes decisive steps to reduce methane emissions with newly revealed strategy" – 10/2020 (link)
53	Set up of a database on regulatory instruments	IEA	Ongoing	Database (Canada publication) Workshops (Link)
66	Analysis of GHG savings of biogas & biomethane	EBA	2020	Infographic and accompanying background paper explaining the GHG savings of biogas & biomethane plants (link)

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