

STATUS REPORT (rev 2016-01-29)
Short-Lived Climate Forcers and Contaminants Expert Group

For ACAP WG meeting February 2016, Washington DC

(1) Work accomplished since last ACAP WG in September 2016.

Projects Being Implemented

Project 1: Reduction of Black Carbon from Diesel Sources in the Russian Arctic

The project lead is the United States (US). The US Department of State has prioritized reducing black carbon in the Russian Arctic, and has sought the US Environmental Protection Agency's (US EPA) expertise in reducing diesel emissions to address this challenge. \$5 million USD has been committed by the US towards the reduction of black carbon emissions in the Russian Arctic, part through the Arctic Council. The Diesel Project has \$2.5 million USD led by US EPA. Battelle Memorial Institute (Battelle), Murmansk State Technical University (MSTU), WWF, Russia and NEFCO are all US EPA partners. The US Department of Energy is also responding by developing collaborative programs on combined heat and power to attempt to address the residential sources of black carbon. The US Forest Service is working on reducing black carbon from forest fires and agricultural burning in the Russian Arctic.

From 2011-2016, the US will work on a four-step project to reduce black carbon emissions in the Russian Arctic. Specifically, the US will work to:

- Assess primary sources of black carbon in the Russian Arctic;
- Develop a targeted baseline emission inventory for black carbon from diesel sources, in key areas;
- Implement targeted, on-the-ground demonstration projects for reducing black carbon from diesel; and
- Establish policy recommendations and financing options for reducing black carbon diesel sources.

While the US's work will be focused in the Russian Arctic, the project will collaborate more broadly to reduce diesel black carbon emissions across the Arctic.

- The project Murmansk area emissions inventory was completed in October 2014. An article by members of the team from Battelle and MSTU, titled, *Black carbon emissions from Russian diesel sources: Case study of Murmansk*, has been published in the journal, *Atmospheric Chemistry and Physics* in July 2015 (<http://www.atmos-chem-phys.net/15/8349/2015/acp-15-8349-2015.html>). Another emission inventory article focusing on on-road transport is titled, "A methodology for calculating transport emissions in cities with limited traffic data: Case study of diesel particulates and black carbon emissions in Murmansk" and was published in *Science of the Total Environment* in early 2016: <http://www.sciencedirect.com/science/article/pii/S0048969715313061>.
- A National emission inventory of diesel black carbon will be completed by March 2017.

- The pilot mitigation projects address two of the largest sources of black carbon, on-road and off-road transport. A case study of a bus company deciding to purchase more fuel-efficient buses, which reduced the black carbon in its fleet is completed, presented to the Arctic Council Ministerial and adopted in June 2016 and is available as an Arctic Council published brochure in English and separately in Russian. The Bus company partial fleet upgrade to more energy efficient buses reduced BC emissions by 90%, reduced fuel and O&M costs and improved service.
- Guidelines for mines about off-road vehicles are out as a report and an article in the Russian Journal, *Mining Industry*, in August 2015. Engine repowering, retrofits, vehicle replacement are cost effective as vehicles are then more reliable and fuel efficient. Emissions are also reduced.
- The Battelle/WWF-Russia-developed pilot project, *Wind-diesel Project at Tundra Collective in the Murmansk Region* is being implemented by NEFCO. This Pilot Project is developing a wind-diesel alternative to traditional diesel-powered generators at the remote Tundra Collective reindeer farm in the Murmansk region. Equipment was procured and installed in Spring 2015.
- NEFCO completed two feasibility studies: *Mapping substituting solution for diesel power plants in the Arctic and Northwest Russia* and *Feasibility study for energy supply conversion from diesel in Dolgoshcheliye, Mezenskiy District*. They serve as examples for communities across the Arctic.
- Circumpolar policy and financing recommendations on reducing black carbon from diesel sources were approved by ACAP and will be presented to the SAOs for potential Arctic Council publication in early 2016. Russian-specific policy and financing recommendations were out in the journal *Environmental Science and Policy* in 2015.

Project 2: Arctic Black Carbon Case Studies Platform

The project lead is the US. The Arctic Council Secretariat is moving forward to host a platform that would be interactive and easily evolve with additional information. Initial Case Studies from the U.S. with assistance from the U.S. EPA's Alaska office and Norway have been completed. Project partners are working on cleaning up the platform and hope to have it ready to demo again for the next ACAP meeting. The U.S. continues to encourage any additional partners in this project who would like to contribute informational, in-kind, or financial resources.

Project 3: Valday Cluster Upgrade for Black Carbon Reduction in the Republic of Karelia, Russian Federation

The project lead is the US. This project which concerns eight settlements aims to implement, together with NEFCO, a range of alternatives for providing energy to off-grid settlements in this region. It will result in potential improvement in services, emission reductions, energy savings, and lessons learned that will contribute to an improved energy system across this Cluster of communities. The objectives of the Project are to:

- Contribute to mitigation of pollutants, including SLCPs such as BC and other GHGs
- Decrease the dependence of the Cluster settlements on transported fossil fuels [Reduce the electricity/district heating costs for the municipality]
- Increase the reliability and quality of electricity/district heating supply
- Strengthen the expertise of the local institutions in the energy supply and project management

The project is now in the implementation phase. Five settlements will improve load management and install hybrid solar photovoltaic- wind - diesel systems. Three settlements are dealing with hybrid wood gasification - diesel systems and construction of a small hydropower are somewhat delayed due to financial prerequisites for the projects.

Projects under development not approved by the SLCFC EG

Project 1: Black Carbon and Methane Emissions in the Russian Arctic – Mapping and Mitigating

The Project seeks to improve knowledge on black carbon and methane emissions in the Russian Arctic, with emphasis on the oil and gas sector, and spur enhanced actions to reduce emissions. The ultimate objective is to contribute to reduced emissions of black carbon and methane emissions from the oil and gas sector in the Arctic. The Project should create the basis for concrete mitigation measures and improved policies through better knowledge about emission sources, the scale and characteristics of emissions and abatement costs (including technology options), and cost effectiveness of available options. Efficient and effective policies and regulations require knowledge as a basis for prioritizing actions.

The Project will have a duration of three years and will include:

- Emissions Inventory of black carbon point sources
- Mitigating emissions from flaring sites
- Reporting of methane emissions from the oil and gas sector
- Mitigating methane emissions from the oil and gas sector
- Policies and regulations
- Capacity building and dissemination

ACAP's SLCFC EG approved this project but ACAP did not approve this specific project at their September 2015 meeting. The PSI has expressed interest in further discussing the subject.

The mitigation component for the flaring part of the above project is currently being developed with financing from the Swedish EPA Trust Fund with NEFCO. The project aims to identify black carbon and methane emission reduction opportunities from flaring, in the Russian Arctic and has three tasks:

- Task 1: Review of the flare situation.
- Task 2: Location and volume estimates of flares
- Task 3: Identification of possible flare reduction investment cases

The principal deliverables from the Flaring Project will be a report summarizing the results from Task 1-3, including also a set of recommendation for follow up with possible investment cases requiring further scrutiny a project proposal such as on improving knowledge on and reducing emissions from black carbon and methane in the oil and gas sector in the Arctic through efforts including technical and financial feasibility assessments, project design; mitigation via leak detection and repair etc. for financing from the PSI.

Project 2: System for Black Carbon Emissions Impact Management from sources in the Russian Arctic

The project lead is Russia. This project will include:

- Project launch event
- National methodical framework development
- Inventory of black carbon emissions

- Review of integrated assessment models for black carbon emissions transport deposition and impact assessment
- Development of database for black carbon emission reduction techniques
- Black carbon emissions transport and evaluation of the Russia-originated black carbon emission impact on the Arctic
- Evaluation of black carbon emission reduction technique efficiency and recommendations on the black carbon emissions reduction in the Russian Arctic
- Development of recommendations on the application of the black carbon emissions management system for sources in the Russian Arctic and transfer of the system to an authorized public authority of the Russian Federation for further implementation
- Organization of the final project results international conference

This project is currently under ACAP SLCFC EG review and waiting for Russia to provide another version. A list of comments provided by countries (US, Canada, Sweden, and Norway) is being addressed.

Project 3: Arctic-Barents Region Short-lived Climate Pollutants Mitigation Project

Partners: Interest Tentatively FIN, [NO], RF, SE, USA, NEFCO

NEFCO is working on the development of three SLCP initiatives with a number of respective sub-projects:

Project 1-M: Reduction of Methane Emissions (e.g. see Project 4 below)

Project 2-BC: Reduction of Black Carbon Emissions

Project 3-HFC: Establishment of inventory (Russian Federation); mitigation of HFC (including ODS) emissions (including End-of-Life Equipment)

Not all Projects are expected to proceed, subject to feasibility studies, however. Some of the sub-projects are also on the NEFCO-AMAP Barents Hotspot list, (as Project Kr 14 & Kr16). NEFCO is working to develop a detailed Work Plan.

Project 4: Mitigation of Methane Emissions -- Syktyvkar Dyrnos Landfill Project, Russian Federation

The Dyrnos Landfill project will consist of two main components: Final closure of the existing landfill and installation of a methane gas collection and utilization system and Construction of a new sanitary plot at the existing landfill and completion of construction works and commissioning of a new waste sorting facility.

The Dyrnos Landfill Project will take important steps towards reducing the adverse environmental and health impacts from the current waste management system. It will contribute towards achieving the compliance with the relevant Russian and EU environmental standards, and will be a key contribution to the final exclusion of the Barents Environmental “Hot Spot” Ko-6 (Waste management in the Republic of Komi).

The project is expected to demonstrate the improvement of municipal solid waste management towards integrated waste management systems in Russian cities

It will mitigate of SLCP/Methane emission, improve resource efficiency and reduced release to water

This project is being reviewed by the ACAP SLCFC EG.

(2) Funding expenditures for 2015

Projects being Implemented

Project 1: Reduction of Black Carbon from Diesel Sources in the Russian Arctic.

The US and NEFCO signed an agreement for the US to participate in the Arctic Council (AC) Project Support Fund (PSI) in June 2012. The U.S. has allocated up to USD 5 million to the Arctic Council's environmental projects with a near term allocation is of USD 1.0 million to address BC mitigation from diesel sources by February 2016.

Battelle has \$1,000,000 to expend through August 2015 and \$170,000 to expend through March 2017

Project 2: Case Studies Platform

This has not been funded beyond in-kind. Funding from partners and/or the PSI would be welcome.

Project 3: Valday Cluster Upgrade for Black Carbon Reduction in the Republic of Karelia, Russian Federation

The project has been approved for PSI funding, with a combination of grants, concessional loans, and project owner investment as elements of a comprehensive business plan.

Projects under development not approved by the SLCFC EG

Project 1: Black Carbon and Methane Emissions in the Russian Arctic – Mapping and Mitigating

This project has not been approved and funded yet. Part of the project development for mitigating flaring in the oil and Gas Sector is being financed by the Swedish EPA Trust Fund with NEFCO. Potential to propose to PSI.

Project 2: System for Black Carbon Emissions Impact Management from sources in the Russian Arctic

This has not been funded yet. Potential to propose to PSI.

Project 3: Arctic-Barents Region Short-lived Climate Pollutants Mitigation Project

NEFCO's activities for the SLCP work can be summarized as follows:

No.	Description	Timing	Budget, EURO
1	Energy Supply in 8 Karelian Settlements:	Q42015	up to 4.15 million
2	Tundra Reindeer Settlement	Q4 2015	100 000
3	Mapping alternative solution for diesel power plants in NW Russia.	Q1 2015	30 000
4	Dolgoshcheliie wind-diesel complex.	Q1 2015	90 000
5	Energy Supply Conversion in Kolguev Island.	t.b.d.	t.b.d.
6	Structuring of power supply in Arkhangelsk Region;	t.b.d.	t.b.d.
7	Mitigation of Flaring in the Oil and Gas Sector	t.b.d	t.b.d
8	Mitigation of BC in agri burning (for submission to EG)	t.b.d	t.b.d
9	HFC Inventory, end-of-life equipment	t.b.d	t.b.d

Project 4: Mitigation of Methane Emissions -- Syktyvkar Dyrnos Landfill Project, Russian Federation

This has not been funded yet.

Project 5: Black Carbon mitigation from Agri-burning

This Project is being developed as proposal for EG SLCF. Has been funded by the Swedish Trust Fund with NEFCO. Once approved, it has a potential to propose to PSI.

Project 6: Inventory for HFC, end-of-life equipment

This project is under development and is not yet approved by the SLCFC EG.

(3) Main findings**Projects being Implemented****Project 1: Reduction of Black Carbon from Diesel Sources in the Russian Arctic.**

Results from the project's Murmansk emissions inventory has determined that on-road and off-road transit are two of the largest sources of black carbon from diesel sources in the Murmansk Region.

Project 2: Arctic Black Carbon Case Studies Platform

A number of case studies that demonstrate best practices have been developed and are uploaded onto the Arctic Council Website.

Project 3: Valday Cluster Upgrade for Black Carbon Reduction in the Republic of Karelia, Russian Federation

The project is in the implementation phase.

Projects under development not approved by the SLCFC EG.

The SLCFC EG/ACAP is in the process of identifying potential projects.

Project 1: Black Carbon and Methane Emissions in the Russian Arctic – Mapping and Mitigating

ACAP's SLCFC EG approved this project but ACAP did not approve this specific project at their September 2015 meeting. The PSI has expressed interest in further discussing the subject

Project 2: System for Black Carbon Emissions Impact Management from sources in the Russian Arctic

A draft of this project proposal is being updated by Russia for review by the SLCFC EG.

Project 3: Arctic-Barents Region Short-lived Climate Pollutants Mitigation Project

This project is under development in cooperation with Sweden and potentially Norway and is not yet approved by the SLCFC EG. From preliminary discussions with AMAP (Dec 2013), emissions from gas flaring contribute 42% to Arctic-mean BC surface concentrations. In addition, there is a need to have a common understanding on the methodology to use in determining mitigation measures of respective SLCPs for projects.

Project 4: Mitigation of Methane Emissions -- Syktyvkar Dyrnos Landfill Project, Russian Federation

This project is under development and is not approved by the SLCFC EG .

Project 5: Black Carbon mitigation from Agri-burning

This Project is being developed so has no current findings.

Project 6: Inventory for HFC, end-of-life equipment

This project is under development so has no current findings.

(4) Next Steps for the Projects

Projects being implemented

Project 1: Reduction of Black Carbon from Diesel Sources in the Arctic.

1. A paper on circumpolar policy and financing options to reduce black carbon from diesel sources will be to the SAO's for approval as an Arctic Council publication in March 2016.
2. A national Emissions Inventory of Diesel Sources of Black Carbon will be completed by March 2017.
3. The Project "Wind-diesel project at Tundra Collective, Murmansk Region, Russian Federation will be completed.

Project 2: Case Studies Platform

The following steps are in progress and will continue:

- Continuing case study content acquisition
- Coordinating with the Secretariat and other partners on the platform design
- Continuing partnership outreach
- Website and relevant print product design
- Website and relevant print product launch plan

Project 3: Valday Cluster Upgrade for Black Carbon Reduction in the Republic of Karelia, Russian Federation

The PSI approved the FID of up to EUR 4.2 million with a PSI commitment up to EUR 1.120.000, regarding the Project "Valday Cluster Upgrade for Black Carbon Reduction in the Republic of Karelia, Russian Federation". The project now is under implementation.

Projects under development

Project 1: Black Carbon and Methane Emissions in the Russian Arctic – Mapping and Mitigating.

Approval of proposal by the SLCFC EG. ACAP did not approve the project at their September meeting. The PSI has expressed interest in a potential call and ACAP is in process.

Project 2: System for Black Carbon Emissions Impact Management from sources in the Russian Arctic

1. Finalize the project proposal to be approved by SLCFC EG.
2. Submit the project preapproved by SLCFC EG for consideration of the ACAP WG.

Project 3: Arctic-Barents Region Short-lived Climate Pollutants Mitigation Project

Work is underway with the stakeholders to assess the projects and proceed to develop the ones that are considered sustainable. These will be submitted to the SLCFC EG as appropriate.

Project 4: Mitigation of Methane Emissions -- Syktyvkar Dyrnos Landfill Project, Russian Federation

This project is under consideration of the ACAP SLCFC EG.

Project 5: Mitigation of BC: Agri-burning. The project is under development for consideration of the EG and PSI financing.

Project 6: Mitigation of HFC: Inventory work. Under development for consideration of EG and PSI financing.