

SCANDINAVIAN GREEN PUBLIC PROCUREMENT ALLIANCE ON NON-ROAD MOBILE MACHINERY

LESSONS LEARNED REPORT

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Executive Summary

This report presents the preliminary results and findings of the Scandinavian Green Public Procurement Alliance project funded primarily by Carbon Neutral Cities Alliance. Our main objective was to develop and implement a green joint cross-border procurement focusing on wheel loaders in the Non-Road Mobile Machinery (NRMM) sector for the capital cities of Copenhagen, Oslo and Stockholm and supported by the non-profit partner organization Gate 21 and the legal law firm Bird & Bird.

The purpose has been to send a clear signal to market suppliers and developers as a demand-pull strategy for low and zero emission machines. The capital cities strive to be leading agents in the transformation to a greener society. Therefore, demonstrating the impact of CO₂ reduction through the joint procurement was crucial for the Alliance. Lastly, the ambition has been to upscale and disseminate the green joint cross-border procurement to include other cities.

Cross border joint procurement

Based on an analysis for the Scandinavian NRMM market and a needs assessment for the cities the Alliance narrowed down the procurement, to focus entirely on wheel loaders as a starting point – being in relatively high numbers in cities and the market showing signs towards greenification, especially on small and mid-size weight classes.

The Alliance investigated different procurement approaches and strategies as part of the development phase – which also revealed that the public sector may organize its procurement activities in different ways. The method Competitive Procedure with Negotiation was chosen first, but the Alliance later realized it could limit the procuring of machines to only the Original Equipment Manufacturers (OEMs) and retailers that have machines on the market right now. Instead the Dynamic Purchasing System (DPS) is expected to be the optimal tool to purchase the wheel loaders the cities need, when the market is ready.

The DPS will be launched after the deadline of this report. The applicability success of the DPS will be reported in an addendum to this report in mid/late 2019. Unfortunately, the project did not manage to include the City of Stockholm as a part of the cross-border procurement. The reason is mainly because of differences in procurement approaches as Stockholm do not possess as many NRMM machines, but instead procure service contracts. The machines they hold are not subject to change based on the current market state for wheel loaders. Nevertheless, the City of Stockholm will use the developed tender to manage the cities future procurement of service contracts for wheel loaders and related NRMM machines.

Demand-pull strategy for promoting low and zero emission machines on NRMM market

Greening the NRMM market in the coming years is of utmost importance. The market is susceptible to a 'green push' from cities. More cities collaborating to increase the outreach to the market is key. This project has been a first step in this direction, and it has pushed cities in the Nordic countries in general. Many new projects, city strategies and a general openness towards the importance of greening the NRMM sector have arisen parallel with the Alliance's procurement project.

NRMM sector holds CO₂ reduction potential

In the EU the NRMM sector is estimated to be responsible for around 15% of the total nitrogen oxides (NO_x) emissions and 5% of the total and particulate matter (PM) emission. The Alliance's market dialogue made it clear that excavators are most advanced in terms of number of machines fully electric or hybrid. But the cities' baseline analysis of their own services showed a growing need of versatile mid-size and large wheel loaders to be used for many purposes.

The analysis indicated that there is a CO₂ reduction potential for Oslo and Copenhagen, when shifting from ordinary NRMM to low or zero emission NRMM. When new wheel loaders are in operation, the cities will know the actual CO₂ reduction level. A follow-up on the baseline analysis will happen as part of the addendum when it is clearer what the cities will procure.

Up-scaling potential and way forward

The projects procurement effort has received attention from other cities who are interested in how they can participate. A common, political declaration on the NRMM-sector is intended to be made at the C40 Mayors' Summit in Copenhagen, October 2019. Furthermore, Bird & Bird have committed themselves to host a masterclass on green public procurement approaches in developing markets and cross-borders collaboration at the C40 summit in Copenhagen.

An addendum, following-up on the on-going procurement process between the City of Copenhagen and Oslo, will be provided to the CNCA in mid/late 2019 focusing on the first procurements through the Dynamic Purchasing System, hereby the new machines' cost efficiency and their measured CO₂ reduction. It is believed, that the addendum will have a higher value for other cities when illustrating tangible guidelines for how other cities can replicate the cross-border joint procurement approach.

Introduction

The Scandinavian Green Public Procurement Alliance (SGPPA) looks at procurement within the cities Non-Road Mobile Machinery (NRMM) fleet and procurement of wheel loaders. Essentially, the NRMM's covers a large variety of combustion engines installed in machines ranging from small handheld equipment to construction machinery - i.e. construction and building machines, lawn movers, snowmobiles, forklifts, tractors, sweeping machines, light trucks.

The partnership cities formed by the three Carbon Neutral Cities Alliance (CNCA) cities: City of Copenhagen, City of Stockholm and the City of Oslo, are brought together in a Green Public Procurement Alliance in a NRMM sector that has become an increasingly significant source of CO₂ and air pollution in relative terms, especially of nitrogen oxides (NO_x) and particulate matter (PM).

The target group for this report is the nineteen CNCA cities working to cut greenhouse gas emissions by 80-100 % by 2050 or sooner through transformative changes to core systems. More explicit the group can be defined as cities, municipalities' procurement teams, climate teams and municipal decision makers.

The SGPPA project has an explorative and innovative character hence working on promoting green public procurement, promoting joint procurement across borders leveling relevant legal provisions on the EU level, and this in an underexplored NRMM sector that is novel for the capital cities. Due to the innovative character of the project, the project aims, and mutual prioritization has developed during the project's life time. In a prioritized order the project has aimed at the following:

- 1. Develop and plan a green joint cross-border procurement focusing on wheel-loaders in the NRMM sector. Thereby demonstrate “proof of value” by implementing the developed green joint cross-border procurement.**
- 2. Having the capital cities send a clear signal to market suppliers and developers as a demand-pull strategy to the greenification of the NRMM sector.**
- 3. Reducing CO₂ emission on city level to demonstrate potential and contribute to fulfill cities climate and air pollution ambitions.**
- 4. To secure upscaling of the developed green joint cross-border procurement approach.**

The prioritization of the goals is to be understood as practical and chronological. The Alliance must first demonstrate their willingness to procure to be able to influence the market, thereby reducing their emissions and inspiring other cities to follow their example.

This report presents and analyses experiences from the SGPPA project collaboration from September 1st, 2016 – May 1st, 2019. The project was intended to end after 1,5 year in March 31st, 2018 but was extended with permission from CNCA and additional financing from partnership cities, making it possible to perform a green joint cross-border procurement.

The SGPPA project arises from an initial project idea at an “upscaling green vehicles” workshop held in Copenhagen in January 2016 lead by the City of Copenhagen and facilitated by Gate 21. This Lessons Learned Report concludes the Alliance's activities funded by CNCA. The joint public procurement process is ongoing and lead by the City of Copenhagen. In addition, project management is preparing an addendum to be expected finished mid/late 2019, after the joint procurement process and to demonstrate climate and market impact.

This Lessons Learned Report does not deliver a detailed presentation of the work performed, but rather the essentials of learnings and findings that can prove useful as inspiration and guidelines for other cities. In the addendum mid/late 2019 a follow-up on the performed joint Green Public Procurement (GPP) process will be described stepwise applying a practical approach for cities and municipalities on how to perform a similar green joint cross-border procurement for the NRMM market and what procurement strategy to pursue to fulfill their needs.

Financial support for the project has mainly come from Carbon Neutral Cities Alliance (CNCA), but the project has also achieved co-financing from the City of Copenhagen, City of Oslo and City of Stockholm to secure the implementation of the joint procurement process and legal advice. The project's total budget is 160.000 USD supported with 100.000 USD from CNCA.

Greening the Non-Road Mobile Machinery market

Diesel and spark emission engines installed in NRMM greatly contribute to air pollution by emitting carbon dioxide (CO₂), carbon oxide (CO), hydrocarbons (HC), nitrogen oxides (NO_x), and particulate matter (PM). There is an unexplored potential for cities such as Copenhagen, Stockholm and Oslo to collaborate through strategic Green Public Procurements to transform the field of NRMM's safeguarding health, environment and climate and ensuring cost effectiveness and share that knowledge with other cities in CNCA, C40 and other organizations.

In the EU the NRMM sector is estimated to be responsible for around 15% of the total NO_x emissions and 5% of the total PM emission. The NO_x share is expected to increase to nearly 20% in 2020, while the PM share is expected to decrease. NRMM is also accountable for roughly 100 million tons of CO₂ equivalent emissions annually corresponding to 2% of the total greenhouse gas emissions in the EU27.

NO_x and PM are somehow controlled using stage norms on the European market. Stage norms are used to progressively set standards for new developments within the NRMM sector. An EU-directive (EC 97/68) from January 2017 sets goals for implementing new stage norms for EU members countries. Latest stage norm 5 was implemented with effect from January 1st, 2019. Depending on the country, stage norms mostly cover reduction efforts related to NO_x and PM. In Denmark for example, stage norms do not cover reduction in CO₂-emissions from the NRMM sector and emissions on both state and city levels are not very well documented.

Greening the NRMM market is therefore of utmost importance. As the project has an explorative character and aims at developing joint cross-border procurement methods, CO₂ reductions are thus limited, thus are the market impact. Anyway, in the longer run having more cities collaborating cross-border to increase the outreach and value for cities, benefits of reducing NO_x, PM and CO₂ are expected to rise.

The Scandinavian Green Public Procurement Alliance

The project was carried out as a collaborative effort between the three CNCA capital cities: Copenhagen, Oslo and Stockholm having the partnership organization Gate 21 to coordinate between the cities. The alliance has been assisted by the legal law firm Bird & Bird located in Copenhagen in developing the joint procurement strategy, procurement approach and examining challenges related to the legal framework.

The capital cities strive to be leading agents in the transformation to a greener society. The City of Stockholm plans to be fossil-fuel free in 2040 while the City of Oslo has an ambition to cut CO₂ emissions by 50% by 2020 and by 95% by 2030, compared to the 1990 level. The City of Copenhagen has a more offensive goal of being the first CO₂ neutral capital city in the world by 2025. The capital cities high ambitions require persistency in the search for CO₂ reduction potential. For all capital cities,

a focus on CO₂ reduction for procurement of non-road vehicles was eminent. The alliance has a focus on green joint procurement of non-road vehicles – vehicles owned by the cities. Nevertheless, it soon became eminent that the City of Stockholm possessed very few non-road vehicles and mostly had a need for direct tendering of transport services as they, in contrary to the other cities, are governed by an outsourcing policy when it comes to services performed by non-road vehicles.

Lessons Learned

Lessons Learned summarizes the essential experiences of the three cities in their mutual work on greening the NRMM market through an actual common procurement – from proof of concept towards proof of value when the dynamic purchasing system is established and in function in 2019. The Alliance working group with representatives from each of the three cities has contributed to compile the lessons learned in the Alliance collaboration to date. The purpose of communicating lessons learned to other cities is to share insights into the different aspects of cross-country collaboration within a new procurement area.

The Lessons Learned chapter is structured around the central elements having shaped the project, all looked upon from three perspectives central to development and change projects; value, challenges and impact.

Value is primarily understood as experienced value, such as a higher degree of knowledge, valuable relations or new procurement competences. **Challenges** encompass issues that have influenced and somehow constrained the collaboration and process, and which are relevant for other cities to get an insight into. **Impact** can be both measurable and intangible. Measurable impact is the actual procurement activities, new departmental procedures, or the prioritization of similar, new projects. Intangible impact can be a higher degree of high level administrative or political awareness or to speed up maturing the market.

Progress to date and lessons learned

The progress and lessons learned achieved through the Alliance to date evolves around the demanding task of demonstrating how to change the supply side of Non-Road Mobile Machinery by changing cities' demand in a reciprocal and trust-based collaboration with like-minded cities.

As stated above, the Alliance has focused on stepping from Proof of Concept to Proof of Value, that is proving that a common green public procurement has the potential to push the market. Proving the concept has been performed through a market analysis, a focused market dialogue on wheel loaders and preparing the actual procurement process and documents.

The proof of concept was clearly stated through the market dialogue, which showed that the market is susceptible to a 'green push' from the capital cities. The proof of value will be demonstrated through the cities' purchases of low/ZE (zero emission) wheel loaders using the Alliance's developed green procurement criteria and the dynamic purchasing system. The proof of value is therefore only to be estimated mid/late 2019 and realized in the coming years, when the dynamic purchasing system is active.

Development and change projects in and of large systems take time. Each of the three cities in the Alliance has its' own version of this condition. All members of the Alliance working group experienced a need for a bottom-up approach, that is to push the market and political prioritization through proving the value of the concept. As time and resources must be prioritized, a political declaration, which was part of a deliverable according to the CNCA grant, was deemed too ambitious to perform parallelly with the development of the procurement method. The political declaration was less prioritized in favor of testing

the actual green public procurement. The ambition now is to see a political declaration on NRMM as a result of the C40 Summit in Copenhagen.

A time-consuming activity for the Alliance has been establishing the framework for performing an actual procurement together. The steps were realizing the need for a lead partner, clarifying the role and responsibilities for the lead partner vis-à-vis the other partners, achieving permission in the municipality of Copenhagen to take on the responsibility, and to develop a cooperation agreement for a cross-border common procurement.

Another time-consuming activity has been developing the framework for the actual procurement. For one year the Alliance believed Competitive Procedure with Negotiation to be the best, yet untried, method for an innovative procurement. The procurement method was changed this March 2019 to be based on a Dynamic Purchasing System. To be able to reach this level of awareness, the Alliance has worked intensively on developing a set of green selection criteria. The work with the green selection criteria showed the need for a procurement method with a higher degree of openness towards new low/zero emission solutions in the market.

A necessary instrument for establishing the common GPP between the cities was to have a legal framework through a collaboration agreement. Through months of attempting to meet all needs and clarify all issues, it was at last decided in late 2018 that the City of Stockholm would not be able to sign the collaboration agreement. This resulted in a division of the Alliance, with Oslo and Copenhagen proceeding the development of the common procurement, while the City of Stockholm postponing their procurement of green wheel loaders. There is still a close dialogue between the three cities with focus on sharing the results and experiences of procuring wheel loaders through the Dynamic Purchasing System and the market's responsiveness.

Overview of major project activities and deliverables

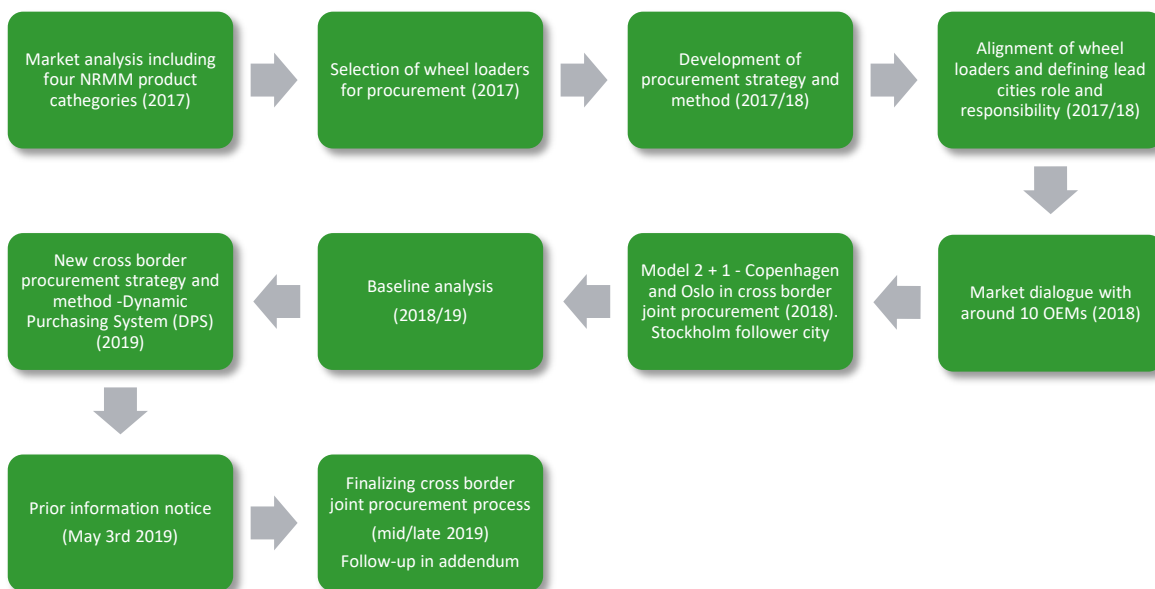


Figure 1: The SGPPA project at a glimpse. Major activities and deliverables during project life time.

Proof of Concept

Market Analysis

The partnership cities have completed a broad market research and made assumptions on which direction to go, in terms of narrowing down specific NRMM categories that would be of most interest for the SGPPA project. Hereafter the Alliance have gone through a market dialogue with global market players, focusing on low- and zero emission drivelines for wheel loaders. This has led to a market research report performed by Provice consultancy in the spring 2017. Its objective was to qualify the foundation for the Alliance's joint procurement and make possible a choice of machine type for the procurement. Guided by the Alliance, Provice consultancy performed the desk top research from Denmark, did interviews with selected manufacturers and OEMs (Original equipment manufacturers) like Volvo CE, Wacker Neuson, JMM, Hydrema etc.

The work resulted in a Market Analysis report for the Alliance finalized in June 2017¹ that comprises an assessment on the following product categories:

- Riding lawnmowers for professional use
- Wheel loaders
- Medium size sweepers (1-2 m³ capacity is defined as medium by suppliers)
- Compact tractors for professional use

The intent was to narrow down the four product categories, having the partnership cities initial interest, to one product category. The partnership cities ended up having a focus on wheel loaders. The decision was settled by a compromise with all three partnership cities having ownership of this product category, however not in the largest numbers. Moreover, this product category showed a tendency towards low or zero emission machines.

Value

The parties have been in contact with close to 10 OEM's and suppliers of small and large wheel loaders within the NRMM market. The market analysis gave a realistic status overview on availability of machines in different segments, and the possible technology evolution going forward. The market is still dominated by diesel machines and in an early phase towards low and zero emission machines. There is a tendency that the market is starting to react to new demand and is looking into alternative driveline solutions other than conventional diesel drivelines. Alternative fuels such as ethanol-diesel (ED95) and methanol (MD95) blended fuel with diesel is the most predominant tendency towards low emission NRMM machines. Also, synthetic Hydrotreated Vegetable Oil (HVO/EN 15940) and biodiesel (EN 14214) is a predominant tendency towards lower emission NRMM machines on the market. The alternative fuels were in particularly discussed in Stockholm, while the alliance cities visited Volvo CE.

The attention on especially excavators and articulated wheel loaders has been useful. It still isn't possible to find machines suited to every need, which especially the suppliers made notice of.

Challenges

The main obstacle was the few models available on the market with zero emission (ZE) and low emission drivelines. The market analysis showed that the transition pace towards low- and zero emission non-road mobile machinery is quite slow. As such, other transport segments will likely be converted earlier.

It also placed the Scandinavian market as a small player in a global market of non-road mobile machinery, meaning that it is difficult for OEMs to justify large R&D spending on models that will see

¹ www.gate21.dk/MarketanalysisNRMM

limited appeal in the market place. At the same time, the Scandinavian market with relatively strong and healthy economies may be a suitable place to introduce these types of machines to the market. This will help bring down the cost and then in turn make them attractive for a wider audience globally.

Finally, a main challenge has been the lack of information about upcoming production plans for low- and zero emission models. Few additional models have entered the market since the completion of the Alliance's market analysis. Another issue is that municipalities today have a need for middle sized machines, while suppliers are more focused on small size machines for city services and very big machines for quarry industries.

Impact

The market analysis has given the cities a better understanding that wheel loaders will be a promising first segment to initiate zero emission non-road mobile machinery in the city. The market analysis made it easier for the alliance cities to determine a focus on wheel loaders (small and large) for the procurement, as there are a few models on the market for wheel loaders that are either hybrid solutions above 4,9 tons or 100% electric in the weight class between 2 and 4,9 tons.

The market for low- or zero emission wheel loaders is in a more mature stage than most other NRMMs. It is worth to mention the NRMM market for sweeping machines also shows signs of maturity towards low- or zero emission machines. Though most machine OEMs are operating with significantly lower production volumes compared to car OEMs, the flexibility on both development and production readiness is higher.

Regarding wheel loaders, several suppliers now have models that have reached Technology Readiness Level (TRL) 8 or 9 for small wheel loaders, which means that the technologies are available in the market and introduced by pilot test or by initial market introduction. For large wheel loaders the tendency of where the market goes technological is still not clear.

The market analysis has been shared with other agencies within the City of Oslo as well as with external stakeholders for information exchange. In general, it is difficult to retrieve information from the OEMs on the NRMM market. Some few global players have though been open and would like to follow up on the dialogue ahead. This tendency is new to the cities and show the influential potential of this alliance.

Wheel Loaders selection

As earlier mentioned, the Alliance based on the market analysis chose to focus its' joint procurement on one machine type representing a good potential for overall greening of the NRMM market.

Value

The selection of wheel loaders benefited the project by providing a narrower scope and a direction in the subsequent procurement process. The Alliance look into zero emission wheel loaders (full electric) and low emission (ICE versions that are becoming certified for high blend ethanol/methanol operation). No hybridization solutions are on the market so far for wheel loaders, only for excavators. Selecting wheel loaders however, has contributed to the cities on different levels.

Selecting wheel loaders is important to the City of Oslo for several reasons. First, the municipality does not own that many machines. Many machines are part of rented services where the service providers own the machines. However, the city does own several wheel loaders in many different size segments. Second, it is important for the City of Oslo to focus on machines where zero emission alternatives is a credible offering on the market, and not in a development stage with uncertain delivery times. Wheel loaders is one of the first segments where zero emission is available for larger machine technologies. Third, being a joint procurement, it is important to the city that the other cities in the partnership also

had a need that centered on the same machine type. The scenario in the City of Copenhagen is alike that in Oslo.

In Stockholm no wheel loaders yet meet the needs of the city. But rising the awareness in the city of where the wheel loaders might be needed in the future, being as they are a machine of versatile use, has also proved to the city of Stockholm that the near future will make available the right type of low/zero emission wheel loaders. In Stockholm it might prove valuable to purchase low/zero emission wheel loaders for sand digging in water purification processes, but a smaller electric NRMM machines from Kramer 5055e has proven too heavy to fulfill the assignment - the electric machine is bogged down in the sand. Though Stockholm is not part of the joint procurement it is expected that selection criteria used to decide on the contract that will be awarded at the end of the procurement, can be used for future service contracts for NRMM machines used in the city.

Challenges

One challenge is that the partner cities to a varying degree own their machines. This fact makes it more complicated to decide on a mutually agreeable machine type to proceed with a common procurement. Without a credible need, it is difficult to move forward with a joint procurement process.

The availability of different machine types is still very narrow. Depending on the size of the wheel loader and thus how much weight it carries narrows down the possible alternative fueling. Small machines may soon be electrified, large machines will for now depend on alternative fuels, but how will demands to the mid-size machines' performance be met?

Impact

The SGPPA project experience has encouraged the City of Oslo to start investigating low- and zero emission alternatives for other machine segments than wheel loaders. The City of Oslo already in February 2016 implemented fossil free construction sites as part of their procurement strategy. The task is undertaken by the Social Housing (Omsorgsbygg). In June 2016, Omsorgsbygg published tender documents for the construction of four new kindergartens, requiring contractors to operate construction sites 100% free of fossil fuel emissions, through for example, the use of electrical construction machinery. The deadline for submitting offers was September (2016) with construction work due to be carried out in 2017. The responses received from potential suppliers and contractors was so positive that the City Government decided to make fossil free construction sites a minimum requirement in all of Oslo's public procurement actions from 2017 and onwards.

Pre-procurement dialogue with the market is fundamental for setting the right requirements into a public purchasing process and the City of Stockholm can use learnings from the joint procurement to set new standards for own material for other machine segments than wheel loaders.

Alliance's Market dialogue

A thorough common market dialogue was performed by the three cities February through May 2018. The Alliance also visited Volvo CE in Stockholm to express need of zero emission machines.

The reason to prioritize a market dialogue was to have a more specific dialogue focusing on wheel loaders before developing the green selection criteria on a level the market will be able to meet. The purpose of the dialogue was also to get a better insight into which OEMs could deliver and which could not.

Value

The market is looking at alternative driveline solutions, but the development is slower than anticipated. It is hard to prove a direct cause-and-effect relation between dialogue and market movements.

However, the cities have noticed increased interest from OEMs to work towards electrifying a larger share of their non-road mobile machinery portfolio. We believe that clear messages from large consumers (such as cities) send a powerful signal about upcoming direction and needs, and that the manufacturers are starting to shift favorably towards low- and zero emission machinery.

The alliance expressed a need towards zero emission machines while visiting Volvo CE in Stockholm. The visit gave the Alliance the impression that focus for now is on hybrid solutions for larger wheel loaders, but new electric models are being considered. The visit also clearly showed the OEMs are very interested in having cities/buyers express their common needs. Alliances or other joint platforms as this will help to drive future research and development focus. Volvo CE therefore welcomed the SGPPA Alliance visit.

Alternative fuels were also discussed with Volvo CE, but the alliance especially wanted to obtain a focus on zero emission NRMM as a high ambition because the Alliance see alternative fuels as a technology that potential can delay transformative change towards innovative zero emission technology. However, there are differences between the alliance cities, as Stockholm have a greater focus towards how alternative fuels for an interim period can be utilized, making it possible to mature zero emission technology to be market ready. Copenhagen and Oslo are keener on pursuing zero emission technology now, hereby hybrid and pure electrified NRMM machines. This ambition to pursue zero emission technology is also highly reflected in the performed market analysis.

The dialogue led into close dialogue with some OEMs to make us understand where they are presently and if they were developing solutions relevant for the alliance. Furthermore, we talked to battery pack producers and got a great insight into the battery tech development and price structures. This gave us better background knowledge to enter dialogue with the articulated wheel loaders OEM. Due to this we got to know from some of the OEMs that the EU Stage 5 would lead to 300% percent cost increase for the engine and for the aftertreatment system for diesel particulate filters and catalysts for heavy-duty diesel engines. In January 2019 Volvo Construction Equipment announced to produce a compact machines range with electric drivelines (excavators, wheel loaders, dumpers) on smaller NRMM machines². The alliance's market dialogue also made it clear that excavators as the category of machines are most advanced in terms of numbers with full electric and hybrid-based drivelines.

Challenges

OEMs are skilled at keeping developments confidential, which makes it challenging to get the factual, latest updates on their internal processes for technology developments. This is exemplified by our site visit to Volvo outside of Stockholm in the fall of 2017 (as part of the project) where the manufacturer shared very little information about upcoming products. In spring 2019, Volvo released a teaser about two fully electric lines on both excavators and wheel loaders. It is a difficult barrier to overcome, as the manufacturers see this as a strategic advantage. On the personal vehicle side, however, it has become more common to share information about model lines that are 2-3-5 years away to gauge customer interest, drive up demand, and secure financing for new projects. It could be that the OEMs will follow. All in all, the market is looking at alternative driveline solutions, but the development is slower than anticipated.

Impact

The cities have gained a hands-on understanding that the market is rapidly changing, and that frequent dialogue is one of the best ways to stay abreast of the latest development and help drive the direction towards low- and zero emission machines. The alliance made an overview of all the zero emission machines on the market now and where they are sold from. Wheel loaders are being used in farming

² <https://www.volvoce.com/europe/en/about-us/news/2019/volvo-ce-goes-electric-on-smaller-machines/>

and constructions. Therefore, we saw that the same machine (with another color) is being sold from often two different vendors. This was useful to secure a full market dialogue.

The transition towards zero and low emission non-road mobile machinery will expectedly take longer than the logistics, collective and personal transport. The levelling of expectations in the cities gained through insight into the market is an important knowledge on which to base coming projects and purchases.

The OEMs may have taken the alliances' signals of upcoming procurement needs into ongoing development processes, but this is not verified.

Proof of Value

Baseline Analysis

A baseline report has been drafted by the City of Copenhagen in beginning of 2019³. The baseline report focuses on the potentials for CO₂ reductions. Firstly, a baseline for CO₂ is calculated partly based on digital consumption readers installed in wheel loaders in the City of Copenhagen. Next, the data has been extrapolated to cover the City of Oslo. The city of Stockholm hasn't been included in the baseline study as they are not participating in the joint procurement process.

Value of a Baseline Analysis

It is critical for the Alliance to demonstrate "proof of value" of how effective the cross-border joint procurement is in reducing CO₂ emissions in the cities in the alliance. This is a clear goal for the Alliance: Reducing CO₂ emission on city level to demonstrate potential and contribute to fulfill cities climate and air pollution ambitions. As the joint procurement process is in process during the writing of Lessons Learned, there is still no evidence on the specific impact of the joint procurement, but several scenarios have been specified to give an impression of the CO₂ reduction potential for wheel loaders.

The baseline analysis has mapped the potential for CO₂ reduction for wheel loaders ranging from 2-37 tons in total weight. The City of Copenhagen today owns 15 wheel loaders all running on diesel. The total CO₂ emission is estimated to 455 tons CO₂/year. Three of these are large wheel loaders (14 tons) with a heavy-duty operation cycle. The last 12 are small (2,5 tons) and medium (6 tons) with a light duty operation cycle. When converting from diesel to full electric driveline on the first two weight classes (economic feasible/market initial pricing ranges) in Denmark this will give a calculated CO₂ reduction of 80% - from 63 tons to 13 tons. If converting to mild hybrid driveline on the third and highest weight class (14 tons) this will give a CO₂ reduction of 15%, with an average consumption reduction of 15% (compared to conventional diesel operation) from 392 tons to 333 tons.

Total estimated CO₂ baseline for diesel operation for wheel loaders at the City of Oslo, Agency for Waste Management is 374 tons of CO₂ distributed on a total of 21 wheel loaders in different sizes.

To estimate the potential emission reductions, the following cases have been set up:

Scenario A: If converting from diesel to full electric driveline on the first two weight classes (economic feasible/market initial pricing ranges) up to 14 tons in Norway this will give a CO₂ reduction of 29%, totaling 110 tons. This figure is slightly lower than 110 tons given the CO₂-emission factor from Norwegian hydropower. However, since this factor is extremely low (16,4g CO₂/kWh), it is for the purposes of this estimation considered negligible. Hence, we consider electrification as removing the CO₂ emissions in its entirety.

Scenario B: If converting to mild hybrid driveline on the third and highest weight class above 14 tons this will give a CO₂ reduction of 15%. This is simply estimated because of reduced average fuel consumption by 15% (compared to conventional diesel operation). The corresponding CO₂ emission reduction is 39,6 tons.

In total, by fully electrifying the first two segments and achieving mild hybrid on the last segment, Oslo may reduce its emissions by 149,6 tons CO₂. This is assuming that all the wheel loaders will be replaced, which will not be the case in practice. As mentioned earlier, the Agency for Waste Management foresees initial replacement of 2-4 of the smaller sized wheel loaders.

³ www.gate21.dk/BaselinereportSGPPA

Table 1 summarizes findings of the baseline analysis:

City of Copenhagen	Small weight class < 2,5 tons	Medium weight class > 2,5 - < 6 tons	Large weight class > 14 tons	Total	Comments
Non-road machines	5	6	4	16 pieces	
Engine size in kW	25	55	112	25 – 112 kw	
EU Stage Norm	Stage 3B	Stage 3B	Stage 3A	-	
Litre per hour	5	8	15	28 litre/hour	
Yearly consumption in litre	7.800	12.800	127.500	148.100 litre/year	
Yearly CO₂ emissions in tons	24	39	392	455 tons CO ₂ /year	
CO₂ reduction potential	<p>Scenario A: Overgoing from diesel to full electric driveline on the first two weight classes (2,5 – 6 tons) = 50 tons CO₂ per year - 80 % CO₂ reduction</p> <p>Scenario B: Overgoing to a mild hybrid driveline for large weight class = 333 tons CO₂ per year - 15 % CO₂ reduction</p>				
City of Oslo	Small weight class < 5 tons	Medium weight class >5 tons - < 14 tons	Large weight class > 14 tons	Total	Comments
Non-road machines	3 (diesel) 2 (electric)	4	12	21	For Agency for Waste Management only
Engine size in kW	25	54	112	25 – 112 Kw	No info available, assumed similar to Copenhagen
EU Stage Norm	Stage 3B	Stage 3B	Stage 3A		No info available, assumed similar to Copenhagen
Litre per hour	5	10	11		No info available, assumed similar to Copenhagen
Yearly consumption in litres	11 250	30 000	99 000		Calculated as # of pcs x litres pr hour pr piecer x # of operating hours
Yearly CO₂ emissions in tons	30	80	264		Using diesel emission factor of 2,67 kg CO ₂ /l diesel.
CO₂ reduction potential	<p>Scenario A: Overgoing from diesel to full electric driveline for the first two weight classes = 110 tons CO₂ per year - 29 % CO₂ reduction</p> <p>Scenario B: Converting to mild hybrid driveline on the third and highest weight class (>14 tons) = 39,6 tons CO₂ per year - 15 % CO₂ reduction</p>				

Challenges

The baseline study was challenged by lack of data from machines running on diesel as only a few machines have digital fuel consumption readers. It was therefore decided to use manufacturers fuel consumption data based on EN 15429-2. These data were compared with GPS data for the machines, so it was possible to track how far the machine had travelled on a given day.

A major source of error is that it is difficult to calculate the wheel loaders CO₂ emission when it is in operation and not moving. The calculated CO₂ levels is therefore most likely higher than estimated, but in comparison with for example excavators wheel loaders are more mobile and therefore this approach was chosen.

Moreover, it has been difficult to measure NO_x and PM emissions and thereby reduction potential, but when choosing an electric driveline, the emissions are locally zero. Nevertheless, this is not the case as it is important to realize that the CO₂ reduction potential is dependent on the type of electricity that charges the battery.

Impact of the baseline study

The real impact of the cross-border joint procurement on green NRMM machines needs to be evaluated when the procurement process has ended, and it is clear what NRMM machines the City of Copenhagen and the City of Oslo has purchased. If possible, the actual CO₂ reduction based on the calculated baseline will be included as part of the addendum later in 2019.

Cross-Border Green Public Procurement with Dynamic Purchasing System

In March 2019 Copenhagen and Oslo changed the procurement method from being based on Competitive Procedure with Negotiation to a Dynamic Purchasing System (DPS). The DPS is easier to establish and will speed up the process towards actual procurement activities. Once the DPS is set up actual tendering can begin. The administrative burden will then be to select bidders on each single tender, which is open for the whole market and not only prequalified candidates which is the case in a framework agreement following the Competitive Procedure with Negotiation. The DPS means less work up front to get ready, but more work down the line when each tender needs to be specified. Generic templates and guidelines also need to be created in advance.

The Dynamic Purchasing System will be launched from Copenhagen in a prior information notice on May 3rd, 2019. The Tenders Electronic Daily (TED) will be used. It is the first important milestone in the Alliance's proof of value, and it will be exciting to follow the market's reaction to the two cities' actual willingness to procure green wheel loaders.

Value of a Dynamic Purchasing System

The DPS gives good flexibility and shorter procurement procedures. DPS was one of the first solutions the cities considered. But at that time the Alliance thought it would be too large a system to set-up. Since then the Alliance has worked with competitive procedure with negotiation. But this method would not allow the City of Copenhagen and the City of Oslo to procure the machines needed. The DPS is expected to be the optimal tool to purchase the machines the cities want, when the market is ready. The DPS should get all vendors on board easily and with few restrictions, since specifications can be set and changed underway when needed.

Challenges in shaping a common GPP on wheel loaders

A main challenge has been determining suitable award criteria for award of framework agreements in a Competitive Procedure with Negotiation. The reason for this is that the wheel loaders wanted by the cities are not necessarily developed yet, and the fact that the framework agreement would be divided

into contract lots – depending on size and technology (zero and low emission). These factors raised considerable challenges in determining award criteria that provide comparable offers (legal requirement).

The Competitive Procedure with Negotiation is not optimal for products in early market development stage as it would force City of Copenhagen and City of Oslo to select the vendors along the tender process. This would have made the cities able to procure zero emission wheel loaders from three to five OEMs/importers only.

The Dynamic Purchasing System provides larger flexibility in the sense that both specifications and award criteria can be adjusted at the time of an actual purchase. It would be less useful to have a framework agreement which is specified for specific wheel loaders – which does not give room for new technologies which might be developed throughout the lifetime of the framework agreement. The DPS provides a larger extent of flexibility and innovation.

Impact of joint GPP

The process of preparing the joint green public procurement has given the cities a better understanding of the advantages and disadvantages of the DPS, and how it fits well with the needs of procuring wheel loaders over a longer time, with varying specifications, against a backdrop of a rapidly changing selection of products on the market.

It has given the cities insights that this type of procurement format could be useful in other contexts, although it comes with benefits and costs. Several joint seminars and conferences on zero emission buildings and construction projects where Oslo and Copenhagen cooperate. Also, it has provided the awareness that an award of framework agreements is less suited to buy products that are not developed yet and where the scope is rather differentiated relating to size and technology.

Green selection criteria

The task of developing green selection criteria for the procurement of low/zero emission wheel loaders has been comprehensive. The criteria were unknown ground and had to be based on the knowledge the Alliance partners gathered from the market dialogue and general media coverage of the NRMM sector.

As explained in the sections above, the Alliance did not want to limit its procurement capabilities because selection criteria did not hit the mark. Working with selection criteria therefore has been an important lesson in building procurement competences in a new market. It also paved the way for changing the procurement method from Competitive Procedure with Negotiation to a Dynamic Purchasing System.

Value

The cities have ambitious targets to become practically zero emission by 2025-2030. Such targets demand radical changes in all emission segments, including the Non-Road Mobile Machinery segment. Working with green selection criteria has made it visible that to push the market, the municipalities need to push themselves by implementing new methods and criteria.

The City of Copenhagen is now in the process of making an internal procurement strategy on vehicles and machines that pushes zero and low emission drivelines. First, full electric on small and mid-sized vehicles and for compact machines up to 6 tons, and alternative fuels for medium and large sized trucks.

The development of selection criteria benefited from experience exchange between the cities. Internally in the City of Oslo stronger ties have been made between the Central Procurement Unit at the City of Oslo and the Agency for Waste Management who represent the end-user perspective.

Challenges

One challenge has been that zero emission machinery typically is only available for smaller machine segments, whereas the cities also have needs for low/ zero emission machines in medium and large segments. As such, using zero emission requirements for a segment where no such machine exists is futile. Because of this, legal issues arise in determining suitable award criteria that provide comparable offers.

The selection criteria must balance issues such as weight, use, operation, fuel and working environment with a continuous consideration for economic viability. To be able through selection criteria to make the green solutions the most viable, it is necessary to calculate Total Cost of Ownership as a first step. Another step is to make low/zero emission the leading criteria, to which the bidders must apply. Depending on the country's legal conditions for promoting green vehicles and machines, it could be relevant to consider a price compensation model for green fuel as incentive.

Impact

The City of Oslo is also focused on using environmental performance as award criteria for other areas such as transportation and emission-free construction sites. The outputs of this project have contributed with increased knowledge and competence for the other procurement processes in the city.

The City of Stockholm has launched the project Green Tractor, where an 18-ton wheel loader running on diesel/ethanol will be tested in 2020-2021.

Cross-border collaboration

The cross-border collaboration has been successful in reaching a common proof of concept – that is every activity leading to the actual procurement. The City of Stockholm had to withdraw from participating in the common procurement on wheel loaders, since clarifying legal issues concerning liability in a common procurement proved too difficult. In 2017 and 2018 the working group has worked closely together in shaping and undertaking the market analysis, market dialogue, selection criteria and procurement method.

From late 2018 the steering committee decided to let Copenhagen and Oslo proceed with the common procurement with Stockholm following on the side. It is important for the Alliance, that experience and lessons learned from the actual procurement through the DPS will be shared with Stockholm.

Value

Using a concrete procurement project to strengthen cross-border collaboration has been valuable, not only in sharing learnings and best practices, but also in terms of taking part in something bigger than one city alone. The project has also generated considerable interest from internal and external stakeholders. The Korean Embassy in Denmark has expressed their interest to follow the Alliance. Municipalities around Copenhagen are highly interested to hear more through Gate 21, for example the Municipality of Ballerup. And the Alliance has been promoted at the conference Greater Copenhagen Mission Innovation arranged by Gate 21 and the green organization CONCITO. A larger group of cities representing the same demands could impress the market considerably.

Knowledge on different conditions for the green transition between the Scandinavian countries is very valuable. Different tax systems and taxation measures is one condition that potentially make conditions incommensurable, but knowledge on the other hand also make the barriers easier to overcome.

The Alliance has established a good collaboration between the cities that counts great colleagues and great knowledge sharing.

Challenges

Varying degrees of management level commitment and varying timelines made it difficult to proceed as one unit. The Alliance's steering committee has presented a willingness to reach compromises which have to a large part compensated for this. The project has also experienced significant issues with video conference systems making cross-border virtual meetings challenging. In turn, this necessitated significant and sometimes cumbersome email exchanges.

The cities are very different in the way the cities operation is structured. Copenhagen owns a very large fleet. Oslo owns a few areas of their operation. Stockholm owns almost no machines. Oslo and Stockholm have privately owned companies through which the operation of machines usually takes place. So very few areas of operation were open for selection of machines categories to look into.

A significant issue has been the projects' failure to include Stockholm in the collaboration agreement on the procurement procedure going forward. For Stockholm there were several legal and practical issues preventing the city from taking part on the same level as Oslo and Copenhagen. To a certain extent, this will be compensated by Stockholm conducting their own procurements inspired by the project deliverables. Nevertheless, the market signal would have been even stronger if all three cities were included in a joint procurement process. It is therefore crucial that cities that cooperate in a common procurement process have the same needs and follow the same procurement of either services or machines. The SGPPA project did not allow for having two procurements processes.

Impact

The collaboration has provided an understanding that several cities in the region could be included in other cross-border procurement projects, although the work involved makes it more suitable for larger cities with significant in-house procurement competencies.

The Nordic Council of Ministers has launched a new project supported by the Climate-KIC initiative that will promote the greening of the NRMM market as well. Copenhagen, Stockholm and Oslo cities are all participating in this new project as well as Helsinki.

Lead city role

As progress was made by choosing wheel loaders and approaching an actual tender, the necessity of an Alliance procurement organization became apparent. Stockholm and Oslo both pointed to Copenhagen as the right city for leading the procurement process. Project management of the activities supported by the CNCA grant was placed with Gate 21 just outside of Copenhagen. And legal assistance had already been delivered by Bird & Bird in Copenhagen, while negotiations for a framework agreement on legal assistance throughout the procurement were in process.

The City of Copenhagen was quite willing to take on the lead city responsibility. This responsibility demanded a detailed description of the role to get the broad clearance and commitment for all departments involved. It took minimum half a year to entirely settle the lead city role and responsibilities vis-à-vis the other cities.

Value

For the City of Oslo, it was critical that Copenhagen was willing to take the lead city role because of its closer geographical ties to legal resources and project management that located in Copenhagen. It was quickly seen as the most resource-efficient way of proceeding with the project.

Challenges

At times, the project has struggled with wavering commitment from several of the partner cities. The significant project length has also made it difficult to align the project progress with procurement needs. Oslo is pleased that Copenhagen has remained a lead city throughout the difficulties.

Another main challenge was deciding on how to execute the cross-border joint procurement. There are basically two ways of executing a cross-border joint procurement:

1. Joint procurement procedure in its entirety could be carried out jointly in the name and on behalf of all contracting authorities concerned or
2. Joint procurements could be conducted in a way that one contracting authority manages the procedure on its own behalf and on behalf of the other authorities.

In both cases the contracting authorities are jointly responsible for fulfilling their obligations. The alliance decided for the latter approach (2) having the City of Copenhagen leading the procurement process.

Impact

Describing and agreeing on the lead city role in common has improved the level of trust between the implicated cities. Having a lead city in the Alliance's collaboration has proved indispensable to go through with the common procurement.

Procurement Strategy

The procurement strategy has been a work in progress throughout the collaboration, with the first version approved by the steering committee in the spring 2017 and final version ready in early 2019. The cooperation between the cities had then reached a point where it was necessary to formalize the procurement strategy and to have it signed together with the collaboration agreement at executive level. The procurement strategy describes the focus, procurement method and partners' organization.

Value

The procurement strategy provides a clear agreement on roles and responsibilities between the different partners involved. It is a strong summary document for those not familiar with the project details. The process of defining the strategy made the cities understand their actual needs better and know how the tender process should be.

Challenges

One of the main challenges with the procurement strategy concerns alignment of different needs and timelines. The alignment of departmental differences, different needs and different approaches to procurement methods made the strategy writing complex. Willingness to meet each other is crucial and time-demanding.

Impact

The strategy is recently completed, and it is too early to tell what changes the strategy will lead to. However, it may provide a general format that could be useful for other procurements in the future.

RECOMMENDATIONS TO OTHER CITIES

Based on the lessons learned by the Scandinavian Green Public Procurement Alliance, the following section summarizes the Alliance cities' recommendations to other cities in CNCA and elsewhere aiming at greening their procurement of Non-Road Mobile Machinery or Non-Road Mobile Machinery dependent service contracts.

Market Dialogue

- In an emerging Non-Road Mobile Machinery market, there is a huge potential to **push the development through market dialogue**, where cities communicate their need of machines/services as well as their readiness to procure to the market and in return get insights into which machines are available now or in the near future.
- The Alliance highly **recommends more cities to collaborate regionally and internationally on market dialogues**. The more cities in alliances who are ready to communicate with the market, the more influential the dialogue. Such dialogue collaborations will only present few, if any, administrative or legislative hindrances.
- The Alliance recommends **the market to be open in their communication about development lines** to gauge customer interest, drive up demand, and to secure financing for new public procurements.

Collaboration between cities

- The Alliance assesses **collaboration between cities as essential to speed up the maturing of the market** for green Non-Road Mobile Machinery.
- For new city alliances on green public procurement to be successful, **aligning expectations is key**.
- **The procurement strategy is an essential tool** for aligning the focus of the collaboration, the prioritization of goals, and the expected resources each city is willing to spend. The procurement strategy is an important tool for external communication, too.
- Joint green public procurement in an emerging market **should focus on either the procurement of products or services**.
- It is important to **have a lead city that takes on the role of manager of the process**, manages the common data and documents, and conducts the dialogue with the market.
- **Physical meetings regularly are essential** to build relations, understanding and trust.
- A **professional video conference-system subscribed to by all partners** is highly recommended.

Conclusion

The introduction mentioned the priority order of the Alliance's common goals for the collaboration. As described in the lessons learned section of this report, the most successful achievement so far has considered aim #2: *Having the capital cities send a clear signal to the market suppliers and developers as a demand-pull strategy to the greenification of the NRMM sector.*

Greening the NRMM market in the coming years is of utmost importance. The market is susceptible to a 'green push' from cities. More cities collaborating to increase the outreach to the market is key.

This project has been a first step in this direction, and it has pushed cities in the Nordic countries in general. Many new projects, city strategies and a general openness towards the importance of greening the NRMM sector have arisen correspondingly with the Alliance's procurement project.

The transition towards zero and low emission Non-Road Mobile Machinery will expectedly take longer than the logistics, collective and personal transport market. This levelling of expectations in the cities is important knowledge on which to base coming projects, purchases and collaborations. It also emphasizes the need for the cities to act.

The baseline analysis indicated, however, that there is a CO₂ reduction potential for Oslo and Copenhagen, when shifting from ordinary NRMM to green NRMM. When new wheel loaders are in operation, the cities will know the actual CO₂ reduction level. Vis-à-vis aim #3: *Reducing CO₂ emission on city level to demonstrate potential and contribute to fulfill cities climate and air pollution ambitions* – will be achieved in the years to follow.

The Alliance's market dialogue made it clear that excavators are most advanced in terms of number of machines fully electric or hybrid. But the cities' analysis of their own services showed a growing need of versatile mid-size and large wheel loaders to be used for many purposes.

Owning machines or servicing one's city through service agreements are two different approaches to green public procurement. Owning machines allows for a higher degree of direct market dialogue based on the cities' needs and uses. Service agreements presents a higher potential volume for greening the market, but the market dialogue then must include service providers.

Not being able to include Stockholm in the common procurement was a disappointment for all parties involved, but time prioritization and different approaches made it necessary to decide to proceed with the procurement without Stockholm. This is compensated for by Stockholm conducting their own procurement by using the green selection criteria and having better knowledge of right choice of procurement method.

A Competitive Procedure with Negotiation was not considered optimal for the procurement of wheel loaders in early market development stages. It would probably have limited the procuring of machines to only those OEMs and retailers that have machines on the market now. Working intensively on the development of a whole new set of selection criteria proved key in this realization.

The Dynamic Purchasing System is expected to be the optimal tool to get the wheel loaders the cities need, when the market is ready. The successful procurement of wheel loaders through the Dynamic Purchasing System will achieve aim #1 for the Alliance: *Develop and plan a green joint cross-border procurement focusing on wheel-loaders in the NRMM sector. Thereby demonstrate "proof of value" by implementing the developed green joint cross-border procurement.*

Even within the EU (Norway is conforming to most EU legislation) tax regulations, procurement legislation and practices, as well as administrative cultures, have made collaborations on this scale comprehensive. But the effort has been worth it when taking the experienced impact on cities own capabilities and the market's responsiveness to the Alliance into account.

Next steps in the cities of Copenhagen, Oslo and Stockholm

The next step for the three cities will be to achieve aim #4: *To secure upscaling of the developed green cross-border procurement approach.*

- A **common, political declaration on the NRMM-sector** is intended to be made at the C40 Mayors' Summit in Copenhagen, October 2019.
- Based on their consultancy for the Alliance, **Bird & Bird will host a masterclass on green public procurement approaches in developing markets and cross-borders collaboration**, back-to-back with the C40 summit.
- The City of Copenhagen has completed an **extensive market dialogue**, assisted by the City of Oslo, and funded by Climate-KIC Nordic and Nordic Council of Ministers. The market dialogue will be replicated in Stockholm and Helsinki in 2019.
- A **new, general procurement strategy on vehicles and machines in the City of Copenhagen** builds on the selection criteria developed by the Alliance and will be implemented through 2019.
- There will be an expected **higher budget allocation for greening the non-road mobile machinery department in the City of Copenhagen** this year.
- An **addendum will be provided to the CNCA in mid/late 2019 focusing on the first procurements through the Dynamic Purchasing System**, the new machines' cost efficiency and their measured CO₂ reduction.
- The addendum will follow up with the **City of Stockholm and present a status on service or machine procurements** using the selection criteria and procurement models developed in this project.
- **In the addendum a follow-up on the performed cross-border Green Public Procurement process will be described stepwise applying a practical approach for cities and municipalities on how to perform a similar green joint cross-border procurement** for the NRMM market and what procurement strategy to pursue to fulfill their needs.

Sources

'Market Analysis for Non-road Mobile Machinery Sector' - www.gate21.dk/MarketanalysisNRMM

Report from Scandinavian GPP Alliance, 20 March 2017

Author: Tomas Sander Poulsen, Provice

'Volvo CE goes electric on smaller machines'

Press release, 17 January 2019

<https://www.volvoce.com/europe/en/about-us/news/2019/volvo-ce-goes-electric-on-smaller-machines/>

'SGPPA CO2 baseline reporting'

Report on baseline for Non-Road Mobile Machinery in the City of Oslo and Copenhagen, 2 April 2019

www.gate21.dk/BaselinereportSGPPA

SCANDINAVIAN GREEN PUBLIC PROCUREMENT ALLIANCE ON NON-ROAD MOBILE MACHINERY

A Carbon Neutral Cities Alliance between the City of Copenhagen, the City of Stockholm and the City of Oslo.

The alliance will:

1. develop, plan and implement a green joint cross-border procurement focused on wheel-loaders in the Non-Road Mobile Machinery.
2. send a clear signal to market suppliers and developers as a demand-pull strategy to the greenification of the Non-Road Mobile Machinery sector.
3. reduce CO₂-emission on city level to demonstrate potential and fulfill the cities' climate air pollution ambitions.
4. secure upscaling of the developed green joint cross-border procurement approach.

In this report you will find the lessons learned and recommendations for other cities aiming at greener public procurement.

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