



A SCIENTIFIC CASE STUDY OF A LIGHTHOUSE PROJECT

CSR AND PROCUREMENT



ABSTRACT

In most sectors, a large share of the total value is created in Procurement. Thus, sustainable business models already start in the Procurement organisation. Based on a case study at AutoCom, one of the world's leading automotive companies, we demonstrate how sustainability goals can be achieved through a well-structured Procurement process. In order to do this, we analyse the impact of precise definition and evaluation of goals, the evaluation of the supplier, the degree of commitment from the organisation, as well as tracking the achievements of goals. Finally, we discuss the impact of a sustainable Procurement process on incentives for supplier innovation in the short and long-term. We deduct that with a sustainable Procurement process, in the short as well as the long run, the achievement of sustainability goals and cost reduction in Procurement are non-conflicting.

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INTRODUCTION

SUSTAINABLE BUSINESS MODELS START WITH A SUSTAINABLE PROCUREMENT PROCESS

Procurement makes up a large part of the economy. In the European Union, over 19 percent of European GDP is generated solely by the Procurement of goods and services in the public sector. In the private sector, the percentage of Procurement is estimated to be even higher. For example, automotive companies tend to spend more than 50 percent of their turnover on Procurement. Thus, Procurement organisations of both private companies and the public sector influence suppliers' incentives for innovation through their selection processes. Therefore, it is imperative that a sustainable business model already starts with the Procurement process.

In the case study at hand, AutoCom, a globally successful automotive company, decides on the Procurement of a powertrain component which is integral to achieve the company's goal of reducing CO₂ emissions of their cars and thereby their goal to fight climate change.

We describe the elements of an optimal Procurement process and demonstrate their successful application based on this case study. We infer that an optimally implemented Procurement process enables competition between suppliers in such a way that the optimal offer of the most sustainable supplier will be selected. Thus, a conflict between sustainability goals and other important goals, for example guaranteeing product quality and controlling costs, does not emerge.

The optimal Procurement process at AutoCom was set up as follows: Firstly, CO₂ emissions targets were converted into a monetary valuation. This was the only way to ensure that the balance between all relevant dimensions could be retained precisely. This valuation was then transferred into a bonus/penalty system which enabled a comparison between different suppliers and induced incentives for the suppliers to consider future CO₂ emissions when designing the component. Subsequently, based on an optimised negotiation design, suppliers had to compete with each other. For this purpose, the senior management committed to accepting the negotiation result as it was to emerge on the day of negotiations. This commitment protected suppliers against renegotiations and ensured that all suppliers submitted their best quote during the negotiation. Since the specifications of the product were not finalised at the time of the negotiation, it was tracked at a later time if suppliers could meet the promised CO₂ reductions. Potential deviations would have been punished via monetary penalties.

Overall, AutoCom not only ensured that goals regarding climate protection were achieved but was also able to induce appropriate incentives for suppliers to consider those goals during their development process. This shows that an optimal Procurement process, incorporating sustainability goals, not only selects the optimal offer but also sets long-term incentives for suppliers to align their production with those sustainability goals.

CHALLENGE

ENSURING SUSTAINABILITY IN THE PROCUREMENT PROCESS

In this section we will describe the challenges companies face looking to implement sustainable Procurement. In the second part of the section, we will present the case study.

GENERAL CHALLENGES

In Procurement, companies pursue a multitude of different goals. On the one hand, the company wants to select a supplier who supplies a good product that fits the product specification. Here, different factors like sustainability, quality and functionality play an important role. The price, however, is a significant factor as well, as the company is only able to offer a competitive product in the market if Procurement costs are kept low.

This implies that balancing this multitude of different goals is one of the essential challenges of sustainable Procurement. In order to achieve this, it is particularly important to assess the goals unambiguously, verifiably and monetarily, and to select the optimal offer according to this assessment. In doing so, it has to be ensured that suppliers and their products are made as comparable as possible. This creates the most efficient competition between suppliers. This competition in turn ensures that at the end of the Procurement process, suppliers submit the best offers possible and that the best overall offer is accepted. Sustainability goals play a prominent role in the assessment and lead to a competition which rewards particularly sustainable suppliers.

In the long run, the goal is to create a pool of suppliers which enables a reliable and long-term cooperation. Incentives for innovation play an important role here. Indeed, here it is especially important to track if commitments which were made during the Procurement process are complied with and to reward innovations.

In summary, the challenges faced include:

1. Assessment of the Procurement process goals, especially sustainability goals
2. Creation of comparability among suppliers through a bonus/penalty assessment
3. Creation of competition with appropriate competition incentives
4. Tracking of results and creation of incentives for innovation

REDUCTION OF CO₂ EMISSIONS OF CARS OFFERED BY AUTOCOM

The social awareness for the consequences of climate change and short-term oriented and strictly profit maximising corporate policies, has grown constantly over recent years. In the context of this development, the international automotive company AutoCom wanted to become more sustainability-oriented.

Specifically, AutoCom set itself goals regarding the CO₂ emissions of all future car lines. Those goals naturally had to be considered in the Procurement process, especially regarding the Procurement of components for future car lines. Under the provision of these goals, the Procurement of an integral component of the vehicle's power-train section was newly structured, as its efficiency directly affects the fuel consumption and therefore the CO₂ emissions of the vehicle. The new Procurement process should induce suppliers to submit attractive tenders not only with regards to prices, but also with regards to a potential reduction of CO₂ emissions.

THE SOLUTION

THE SUSTAINABLE PROCUREMENT PROCESS

In this section, we will describe, step by step, the elements of a Procurement process which ensures the achievement of sustainability goals without neglecting other Procurement goals. Each of those elements will be illustrated based on the Procurement process at AutoCom.

FORMULATION AND MONETARY ASSESSMENT OF GOALS

As outlined before, the essential requirement for an efficient and sustainable Procurement process is the unambiguous assessment of goals to balance the different dimensions.

General Considerations:

Precise assessment is required to achieve goals

As a starting point for the assessment, it is important to fully define every dimension of the goals. Two different kinds of goals have to be distinguished: Compensable and non-compensable goals. Non-compensable goals are such goals which cannot be traded-off at any price. One example is that suppliers should attest that they produce under fair conditions. Compensable goals are goals which can potentially be substituted in other dimensions. As an example, a slightly higher reject rate in production can be compensated by an increased lifetime of the offered product.

Of utmost importance regarding the assessment of goals is to have a common unit of measurement of those goals. Only if such a common unit exists, it is ensured that goals are made comparable. Since the purchasing price always plays an essential role in the

achievement of goals, the common unit of measurement has to be monetary. Score systems for individual quality attributes, which are widely used by many companies, are particularly inadequate measures since they cannot be transferred into the same scale as the purchasing price. A monetary unit enables the company to determine the "Total Value of Ownership" for every possible combination of product attributes and price offers. This "Total Value of Ownership" describes the value which a selection of components from a certain supplier yields.

The biggest challenge is to find a monetary assessment for individual goals. This is particularly the case for sustainability goals, whose values often emerge outside of the company. For this purpose, it has proven instrumental to use heuristics, which rely on abatement costs to assess the monetary value of sustainability goals. As an example, a supplier with a high reject rate - one could determine the costs necessary to hire engineers solely to improve this reject rate to a certain point. These costs would have to be compared to the number of parts which would then need to be returned. Based on the case study we will demonstrate in the following section that those heuristics can prove instrumental for sustainability goals.

Case study:

The assessment of suppliers' solution concepts is based on the cost of CO₂ emissions

One goal of AutoCom's Procurement department was to consider CO₂ emissions when procuring the powertrain component. To enable this criterion to influence the Procurement decision, a monetary assessment had to be made.

AutoCom undertook three steps to transfer its sustainability goal into a monetary value:

1. The impact of the powertrain component on CO₂ emissions of the car was determined. The technical department identified two relevant parameters:
 - Weight: An increased weight of the product increases the overall weight of the car and therefore leads to a higher fuel consumption and higher CO₂ emissions.
 - Efficiency: A reduced degree of efficiency (for example due to low-quality materials, increased frictional losses or a suboptimal technical implementation) leads to higher fuel consumption and CO₂ emissions.
2. The amount of CO₂ emissions, which was defined as a target value for the entire car, was transferred to specific target values for both parameters of the powertrain component. The target value for the weight was set to 1 kg¹, the target value for efficiency was set to a minimal degree of efficiency of 65%¹.

Finally, it was determined how a deviation from the target values regarding weight and efficiency is assessed in monetary terms. A benchmark for this was, among others, the amount of potential penalty payments for a violation of legal requirements on pollutant emissions. Apart from that, there were other factors like loss of reputation or decreasing sales figures in metropolitan areas which influenced the monetary assessment of increased CO₂ emissions². The monetary assessment was determined as an absolute value per powertrain component. Exceeding the target value for weight was penalised with 20 Euro/kg¹, exceeding the target value for efficiency was penalised with 10 Euro per percentage point.^{1,3}

Several departments were involved in deriving the monetary assessment described above: The Technical and Development department determined the influence of the powertrain component on the emissions of the car, the Marketing and Finance department determined the financial impact of increased/decreased CO₂ emissions through the market and consumers, respectively. Finally,

the Procurement department supported and coordinated the monetary assessment. Therefore, the decision-making imperatively had to be a cross-functional task.

ASSESSMENT OF SUPPLIERS THROUGH A GOAL-ORIENTED BONUS/PENALTY SYSTEM

After the assessment of the individual goals has been determined, the next step in an efficient and sustainable Procurement process is the creation of comparability of suppliers through a bonus/penalty system.

General considerations:

Comparability of suppliers is required for efficient Procurement

The reason to use a bonus/penalty system is to create a relative comparability between different suppliers. In order to do this, the assessment of the previous section has to be condensed to a single number; the so called "comparison price". The comparison price is determined by increasing or decreasing the quoted price of the supplier by a bonus or a penalty. The comparison price reflects every assessment criterion, induces comparability between suppliers, and thus sets the stage for efficient competition.

A supplier is granted a bonus on their quoted price whenever they are relatively better in a positive criterion than their competitors. As an example, a supplier who produces a component with a relatively higher lifetime could be granted a markdown equal to the assessment value from the previous step.⁴

A supplier receives a penalty on their quoted price if they are relatively worse in a negative criterion than their competitors. As an example, a supplier who uses more non-regenerative resources than their competitors might receive a penalty equal to the assessment of the previous step.

Bonuses and penalties can be either of absolute or relative value. An absolute bonus or penalty reflects criteria which are independent of the price and is added as an absolute value to the offered quote.

¹ For reasons of anonymity, all numeric values in the case study have been changed.

² We want to point out that other possibilities for monetary assessment exist: CO₂ emission certificates would make an internal monetary assessment of pollutant emissions superfluous for AutoCom, since their price is determined by supply and demand. However, at the time of the case study, a free market for emission certificates was not yet established. Therefore, no information on a market price could be determined.

³ Analogously, reduced CO₂ emissions were rewarded with a corresponding bonus since AutoCom was not only interested in meeting the sustainability goals but also in exceeding them. This allows other components to exceed their individual target values if the share of CO₂ emissions of the powertrain component is lower than initially planned. Furthermore, a car with low pollutant emissions creates an additionally positive reputation.

⁴ Bonuses and penalties only express relative differences between suppliers. Therefore, it does not matter for Procurement if a certain assessment factor is expressed as a bonus or penalty. A differentiation might be helpful for suppliers to better distinguish between positive and negative factors.

Examples are logistics costs or the assessment of emissions caused by transport. A relative bonus or penalty reflects criteria which depend on the offered quote and is multiplied as a relative share to the offered quote. An example is the lifetime of the proposed product. Relative bonuses and penalties are also instrumental in reflecting criteria which are not easily objectivised such as the innovative capability of a supplier.

Case study:

Comparison of suppliers based on weight and efficiency of the components

The final Procurement decision in the negotiation regarding the powertrain component should take into account the unit price and – to the same extent – the sustainability goals in terms of weight and efficiency. For this purpose, every supplier was awarded a bonus/penalty value which directly resulted from a comparison of the technical attributes to the target values of AutoCom, and the associated financial loss or gain. However, this required a certain maturity in the suppliers' technical development process. Thus, the bonus/penalty assessment took place after the suppliers had supplied a first commercial quote and thereby offered an initial technical specification.

The bonus/penalty value regarding the weight of the component was easily determined, given the weight data could be directly taken from the technical specification.⁵

The bonus/penalty value relating to the efficiency of the component was not obvious from the technical specification. Thus, the expected degree of efficiency of the powertrain component was directly requested from suppliers. Here, AutoCom took into account that the development process was not yet finalised; hence, the degree of efficiency could potentially still be increased through technical improvements. Therefore, two values regarding the degree of efficiency were requested from suppliers:

1. A value the supplier can already guarantee at this stage of the development process.⁶
2. An estimation on which degree of efficiency is achievable through technical cooperation until the product is finalised. This estimation had to be supported by additional data and

documents. AutoCom reserved the right during negotiations to increase the bonus of any supplier based on the credibility of their information over the guaranteed value from 1.

Finally, the supplier-based bonus/penalty value resulted from the sum of the bonus/penalty values for weight and efficiency.

BINDING NEGOTIATIONS AFTER COMMITMENT BY STAKEHOLDERS

To guarantee the effectiveness of the assessment and the bonus/penalty comparison amongst the competition, the negotiation has to be individually designed to fit the particular competitive situation at hand. Additionally, all stakeholders have to commit themselves wholeheartedly to the result of the process..

General considerations:

Only if the negotiation can be adapted to the competitive situation and all stakeholders obey the result, can the true potential be realised

The objective of the Procurement process is the maximisation of competition between suppliers. The assessment reflects the most important goals, especially sustainability goals, while the bonus/penalty assessment enables a comparison of the offers of different suppliers. Thus, competition ensures that, on the one hand, suppliers submit the best offers possible and, on the other hand, the best offer possible is indeed selected.

It is particularly important that the rules of the Procurement process are already specified and made transparent to suppliers before the negotiation takes place. All stakeholders of the procuring company have to commit themselves not to deviate from the rules of the negotiation. Only if those requirements are met, suppliers can focus on preparing the best offer for the negotiation without the need to withhold strategic reserves from their offer for a potential renegotiation. Otherwise, suppliers who submitted the best offer in the process and are not selected will lose their trust in the Procurement organisation and will not submit their best offer in future Procurement projects.

⁵As an example, a weight of 1.5kg would lead to a penalty of 10 Euro.

⁶AutoCom also defined consequences for violating this guaranteed value; as listed on page 6

The design of the negotiation rules depends strongly on the specific competitive situation in question, and can consist of elements of different auction types and sequential negotiations.

Case study:

Declaration of commitment from all stakeholders combined with an auction

The external Procurement process for the powertrain component was divided into three steps: 1. supplier communication, 2. an intermission phase and 3. the final commercial negotiation.

1. Communication. All suppliers were invited to an individual meeting where they were informed about the negotiation process. In particular, the rules of the negotiation were outlined to suppliers.

Additionally, all suppliers were informed about AutoCom's criteria for the Procurement decision. Regarding the CO₂ goals, they were also informed how an increased weight or a decreased efficiency would directly influence the comparison price.

Finally, a declaration of commitment from all involved stakeholders was presented. Herein, all stakeholders of AutoCom committed to procure the powertrain component solely based on the communicated rules, and to accept the result of the negotiation with regards to the selected supplier as well as the final price.

The commitment signalled to the suppliers that AutoCom was not going to deviate from the communicated Procurement process. It supported the reputation which AutoCom's Procurement department had built over many years by using the Procurement process described above in a multitude of Procurement projects. AutoCom never deviated from the communicated process, even if this meant losing out on short-term benefits. Thus, AutoCom had established its reputation as a reliable, transparent and fair negotiation party over a long time period.

2. Intermission phase. The communication was followed by an intermission phase, where no commercial negotiations between suppliers and AutoCom took place. This intermission phase constituted an essential element of the Procurement process, as it gave suppliers the opportunity to optimise their product according to the communicated decision criteria. As an example, a supplier could improve the technical specifications of his product, resulting in an increased offer price but in an overall decreased aggregated comparison price (consisting of offer price and the bonus/penalty assessment).

Additionally, suppliers had the opportunity to determine their bidding strategy, as well as their internal evaluation price. This enabled them to submit or accept binding offers during the final negotiation on relatively short notice.

3. Commercial negotiation. The powertrain component represented a new technical product whose technical development was not yet completely finalised. Therefore, no market price was yet established for the product. During the Procurement process, neither AutoCom nor the suppliers could determine the final product costs (after the finalisation of the product development and possible specification changes). AutoCom nevertheless wanted to give the suppliers confidence in their cost evaluation, in order to ensure a sustainable commercial result and prevent the "Winner's Curse"⁷. Therefore, they decided to provide the suppliers with information on the currently achievable comparison price level in the market and to give them the opportunity to correct their internal product evaluation if necessary.

This was achieved by a dynamic negotiation process consisting of several rounds of negotiations. After each round of negotiations, AutoCom communicated the achievable comparison price level to the suppliers who could adapt their bidding strategies, cost calculations and product characteristics for the future rounds on the basis of this information.

During the negotiation, AutoCom exclusively exchanged commercial offers with the suppliers based on comparison prices. Thus, all non-commercial aspects of a supplier (and therefore also their evaluation regarding the CO₂ emissions) were always taken into account.

⁷ An effect in auctions whereby an inexperienced bidder wins the auction because he overestimates the real value of the auctioned good. The Winner's Curse is most often undesired from the auctioneer's point of view, as a bidder without a sustainable cost-calculation wins. In the long run, it also causes the bidders to add a risk premium to their bids.

In order to quickly clarify any questions concerning technical specifications and proposals, a representative from the engineering and development department was present. Questions and queries therefore did not disrupt the process of negotiations communicated in advance, and AutoCom was able to sign a Procurement contract with the successful supplier directly after the negotiation.

TRACKING OF THE PROCUREMENT RESULT

Whether a Procurement process is successful or not can often only be decided months after the negotiation, when the component is actually supplied. Hence, it is of particular importance that both the suppliers and the Procurement organisation comply with the commitments made during the Procurement process.

General considerations:

Commitments given during the Procurement process have to be honoured in order to exclude opportunistic behaviour both in the present and the future

Often, the negotiation and supplier selection take place at an earlier stage of the development process. Thus, both the Procurement organisation and the suppliers are not able to determine which changes will be made to the product and if everything can be developed as planned. For this reason, it is possible that not all commitments from the Procurement process can be honoured. It is therefore particularly important to define how the conditions of the contract would change if deviations were to arise prior to the negotiation. In particular, the Procurement organisation must not succumb to the temptation to use such a deviation to renegotiate the results.

If changes regarding the important dimensions are not anticipated when drafting the contract to be signed after the negotiation, suppliers will use this to submit unrealistic offers during the negotiation and subsequently change dimensions which are relevant for the assessment in their favour. Since relationship-specific investments are made during the development, suppliers take on the role of a monopolist in potential renegotiations and can leverage this to achieve better prices.

The bonus/penalty assessment is an excellent instrument to determine changes in the conditions of the contract, if a change regarding the design of the product arises.

It is equally detrimental if the Procurement organisation were to instrumentalise a change in the design of the product to renegotiate the negotiation result. In this case, suppliers will lose trust in future Procurement processes and will withhold the best possible offers.

Case study:

Penalties for not attaining goals are included in the Procurement rules

A potential danger in AutoCom's Procurement process consisted of the possibility that suppliers could state incorrect specifications regarding the weight and efficiency of their product to gain an advantage in the negotiation relative to their competitors. Since no final specifications of the product existed during the negotiation, such misinformation was not verifiable at the time of sourcing.

For this reason, AutoCom added a rule which was outlined to the suppliers during the communication of the Procurement rules. Namely, the weight and the efficiency of the final product were to be compared to the guaranteed values at a fixed point in time (that is, in a final technical development phase) after the sourcing. If the final product did not meet expectations, the negotiated unit price was to be automatically decreased. The amount of this price reduction would equal the monetary bonus from the negotiation exactly.⁸

Therefore, there are no incentives for suppliers to state incorrect specifications: The monetary value a supplier could gain, relative to his competitors during the negotiation, would later be subtracted from the unit price AutoCom would have to pay.

The length of time spent building the reputation of the Procurement process was also important here: It was clear to all suppliers at the time of sourcing that sustainability values would be examined at a later point in time and that a deviation of the guaranteed values would result in a reduction of the unit price. Only truthful statements guaranteed that suppliers would get the negotiated unit price.

⁸ We want to demonstrate this with a fictitious example: Supplier X submits a unit price of 100 Euro during the negotiation and guarantees a product weight of 0.8 kg. Therefore, they receive a bonus of 4 Euro, that is, their unit price is artificially lowered to 96 Euro. This artificial price is now used to compare the offers of several suppliers and yields a benchmark for the Procurement decision. We now assume that supplier X wins the Procurement. At a fixed point in time after the Procurement, the weight is measured at 0.9 kg. Therefore, the unit price AutoCom has to pay automatically decreases from 100 Euro to 98 Euro.

DISCUSSION OF THE PROCESS

WITH A SUSTAINABLE PROCUREMENT PROCESS THE BEST PRICE-PERFORMANCE RATIO ACCORDING TO THE DEFINED GOALS IS ACHIEVED

In order to understand how the optimal Procurement process works, it is helpful to analyse it in a reversed order.

Since stakeholders commit themselves to accept the negotiation results, and as those results are tracked, suppliers have to submit the best offers possible in order to be selected. The commitment by the Procurement organisation ensures that suppliers can trust the Procurement process.

The bonus/penalty assessment leads to transparency regarding the criteria relevant for assessment for suppliers, and reveals which offer is selected. This ensures that suppliers do not only try to submit the best possible price, but also attempt to change their product in other relevant dimensions of assessment in their favour. This creates incentives for innovation regarding important dimensions and prevents components being solely selected based on price.

This is the reason why the definition and assessment of goals are of particular importance. Through the selection of goals and their assessment criteria, the Procurement organisation is able to control in which dimensions innovation and improvements are especially valuable for suppliers. If sustainability goals like reduction of emissions, conservation of resources and fair production conditions play a prominent role regarding the assessment, suppliers will consider those criteria to a larger extent.

In particular, the optimal Procurement process creates incentives for all suppliers to improve themselves with respect to the defined assessment criteria by inducing competition among them. This implies that the Procurement organisation is able to achieve attractive prices despite pursuing sustainability goals. Thus, sustainable economic activity and cost reduction are not conflicting objectives, especially if efficiency regarding the use of resources is an assessment criteria.



CONCLUSION

SUSTAINABLE PROCUREMENT CHANGES MARKETS IN THE LONG-TERM

Every business model must strive to make long-term improvements and therefore sustainable changes in economic activity are needed. Optimal competition is a powerful instrument to ensure that market participants remain innovative. This only works if the effect of competition is oriented towards the right dimensions. As an example, if only the lowest price is relevant to the decision, competition can act destructively and waste enormous amounts of resources.

What makes Procurement special is that the buyer can direct competition. By using a bonus/penalty system and negotiation design, the buyer can determine important dimensions and is thus able to direct the effects of competition in the right direction. If one considers how important Procurement is as a fraction of overall economic activity, it becomes obvious how powerful incentives for sustainable innovation set by Procurement organisations are. If sustainability goals are optimally taken into account for Procurement, this creates optimal incentives for innovation and long-term market changes.