PRACTICAL STEPS TOWARDS ECO-EFFICIENT CONTAINER HANDLING

Interview with Timo Alho, Director, Product Management, and Jason Gasparik, Director of Sales, Ports & Terminals, Kalmar

Kalmar's Timo Alho and Jason Gasparik discuss the practical steps towards eco-efficient operations for container terminals, in addition to providing tips on how to lower emissions along with fuel and energy consumption.

HOW DO YOU SEE THE CURRENT STATE OF THE INDUSTRY IN ADOPTING ECO-EFFICIENT TECHNOLOGIES?

TA: It's a hot topic at the moment for container terminals and global terminal operators. There's a continuous push to reduce the CO2 footprint of the logistics chain and the container terminal is an important part of this. And this push comes not only from the strategies of the companies themselves, but also from the customers who are really demanding a lower CO2 footprint for the whole chain. Also, port authorities often have a strong drive to reduce the CO2 footprint of ports, sometimes even making this a requirement for granting concessions for terminal operations. Additionally, there are local as well as national governments setting regulations.

There are many different technological solutions to help. In addition to the electrification of yard cranes also the development of battery technology has enabled the use of hybrid power units, which are actually very well suited for this type of heavy lifting equipment, as you can regenerate and store a lot of the energy for re-use.

With battery technology, the next step is of course fully electric equipment, such as straddle carriers that don't have any diesel engines at all. All in all, we have both a need and existing technologies for new eco-efficient solutions, so there are a lot of possibilities at the moment.

HOW TO ACCELERATE THE INTRODUCTION OF ECO-EFFICIENT TECHNOLOGIES IN CONTAINER TERMINALS?

JG: Well, to put it simply, it does mostly come down to money. There is a common saying with customers “It isn’t green if it doesn’t save me or make me some green”. And there are a lot of different ways this can be achieved. You can use less diesel fuel or implement hybrid battery systems as just two common examples. There's a plethora of things that can be done, but ultimately the big conversation is to figure out how

to make immediate financial sense. There are a lot of different programs out there, and governments as well as port authorities have programs and grant opportunities for terminal operators that can reduce that ROI time quite substantially in many cases. As an example, even a "small" grant of $50,000 USD per machine can dramatically reduce the ROI by almost a third.

Ultimately, I don't think you'll find a company that would say they don't want to be greener. Of course, everybody wants to do the right thing. It's just a matter of how we do it, and how it makes financial sense so we can either save money in the future, or somehow make some money in the future off of it, or a combination of the two.

HOW CAN PORT OPERATORS INFLUENCE THEIR EMISSIONS?

TA: Terminal operators have many sources of information where they can start looking at this. Typically, the container handling equipment is the easiest place to begin. Every terminal knows the amount of fuel they use per year. Or if they aren't tracking this, they should be, and the fuel consumption can of course be converted directly to tons of CO2.

Then, if you want to drill down deeper, you start logging the operating hours of the equipment, the number of handled containers, kilometres driven, and so on. That will give you some parameters that will enable you to analyse your CO2 footprint per container move. And once you are measuring something, you can start taking actions to reduce it. And of course, modern systems already provide a lot of information that you can use right away.

Container handling equipment is one part of the equation, but then you have external trucks operating in the terminal, which are more challenging to measure. For these emissions, maybe you don't get the exact measurements in kilograms of CO2, but you still have parameters that help you to start reducing them. For example, you can link truck turnaround times directly to the CO2 footprint that they generate. Likewise with the vessels; the faster you can turn around the ship, the shorter the time it stays in the terminal and therefore the lower the emissions during that period.

WHAT ARE THE EQUIPMENT OPTIONS AVAILABLE FOR IMPROVING THE ECO-EFFICIENCY?

JG: As of today, all Kalmar straddle carriers, shuttle carriers, RTGs and all other yard cranes are already available as fully electric or FastCharge machines. So, you can have locally emissions-free, fully electric strads, shuttles or RTGs. And there are so many advantages to these machines, from reduced maintenance costs to reduced noise pollution.

Or you can choose the battery hybrid, which is a lithium-ion battery powered machine where the primary power of the machine is all coming from the batteries. So that enables us to use a much smaller diesel engine, and to only run the engine when we absolutely need to in order to recharge the batteries, which is a big difference from many of the other hybrid machines on the market and in other industries. Our battery hybrid machines do not require any special infrastructure or changes to operations. You can literally start replacing conventional power machines right now with hybrids and have nothing special to do to implement them.

WHAT DO TERMINAL OPERATORS NEED TO CONSIDER WHEN EVALUATING THEIR OPTIONS?

TA: It's never a "one size fits all" situation. A solution that is good for one terminal might not be suitable for another. Also, the nature of the business will vary between terminals. Many needs are related directly to flexibility. For example, if you need to move a lot of your equipment around the terminal, maybe it's better not to invest in RTGs that are connected by cable reels. However, also the overall investment plans will be different from terminal to terminal, and operators need to consider the remaining lifetime of their existing equipment. So sometimes retrofitting electrification technology can be the better option if actually investing into completely new equipment is out of the question. Then there are the possible subsidies and grants that Jason mentioned. How do these tie into your financial strategy?

And finally, you also need to consider some very specific local conditions such as the quality of the electrical network. Is the power grid reliable enough to serve as the sole source of energy for all your equipment? In some locations, this can be a challenge, so fully electric might not be an option, but hybrid could be your best choice.

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- Timo Alho

HOW CAN TERMINALS GET STARTED ON TURNING THEIR OPERATIONS MORE ECO-EFFICIENT?

JG: I'd like to believe there is a solid reason why 50% of our straddle and shuttle deliveries over the last several years have been hybrids. First and foremost, people understand that they don't need any special infrastructure to deploy these machines. There is a return on investment right there. Sometimes the ROI is accelerated due to grant funding and such, but it's there and it makes sense. And this relates directly to the next concept, which is that for RTGs, strads and shuttles, if you go from a diesel-electric to a battery hybrid, the next logical step in the journey will be all-electric.

The great thing about a hybrid is that you can equip that machine now with certain components so that the conversion to all-electric in the future will make more financial sense and be more economically viable. So, it's really about proper planning and forward-looking investments.

TA: I think it's very important to repeat that this should be seen as a journey, where you set the target and analyse where you are now, and then start step by step towards that goal. Because it might be that the first step may not have an immediate financial payback. You might need to make additional investments in infrastructure for example. But the further you go, the more it will pay back, because all your equipment is starting to use that infrastructure that you've invested in once.

ABOUT THE INTERVIEWEES

Timo Alho, Director, Product Management at Kalmar
Timo has worked at Cargotec for more than 20 years, first in automation R&D, where his key project was the development of the Kalmar AutoStrad™ solution. Over the past few years he has held various positions in terminal automation, from product management to the head of the cranes business line and the Terminal Design Services team. He has been involved in all Kalmar terminal automation projects. Timo studied automation engineering (M.Sc., Automation Technology) at the Tampere University of Technology.

Jason Gasparik, Director of Sales, Ports & Terminals at Kalmar
Jason is a sales professional with more than 20 years of experience in ports and terminals. He is a customer-centric professional that holds himself, as well as others, accountable to deliver results. He works each day to make the future the present in the ever-changing world of container ports and automation. Jason is located in the US and has a degree in mechanical engineering from the New Jersey Institute of Technology.

ABOUT THE ORGANISATION

Kalmar Global provides cargo handling solutions and services to ports, terminals, distribution centers and heavy industry around the globe. We are the industry forerunner in terminal automation and energy-efficient container handling, with one in four container moves around the globe being handled by a Kalmar solution. We improve the efficiency of your every move through our extensive product portfolio, global service network and solutions for seamless integration of terminal processes.