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**Moderator questions in Bold**, Respondents in Regular text.

**KEY: Unable to decipher** = (inaudible + timecode), **Phonetic spelling** (ph) + timecode), **Missed word** = (mw + timecode), **Talking over each other** = (talking over each other + timecode).

**Jim Clarke: Good morning everyone, my name is Jim Clarke of the energy and resource efficiency team, and I'd like to introduce you to practical steps for reducing energy consumption. We have the following speakers, Alastair Nicol of Elements Consultants, Dayna McCreadie of the Consumer Council, and Geoff Crawford who is one of our operational excellence coaches in Invest NI. This presentation-, the presentations will be followed up by a question and answer session which will be handled by my colleague Bernadette Convery. And without ado, I'd like to introduce you to Mr Alastair Nicol, who will give his first presentation.**

Alastair Nicol: Thank you. Morning everyone, and thanks for attending this event, get the slide to move on here. This event's gonna look at the ways in which you can control energy cost, and my name is Alastair Nicol, I'm a director of a company called Elements Consultants, working for more than 40 years now in energy, a bit long in the tooth, and quite a lot of that working with Invest Northern Ireland. So about 20 minutes in which to cover a vast range of subjects, so I'm gonna dive into this and we'll be quick in going through it, but of course you can have the opportunity to ask questions at the end, at which time I'll be very happy to explain anything in more detail. So the things that we want to cover this morning, in summary really but we can go into more detail later, are electrical power consumption, tariffs and operating implications, heat generation and distribution, lighting and control, compressed air management, metering, monitoring and targeting, and that is very important and I'll move it up the list a little bit, and lastly transport efficiency. So first off, cost of controlling electrical power. Well the price that you pay is made up of three parts principally, be commodity costs, that's kilowatt hours if you like, the tax element, which is money paid to the Government for whatever their purposes are, and the market charges, the, the costs of operating the, the SEM, the single energy market. And the way in which the, the bills that you receive really depend on how much you use, which is perhaps slightly obvious, the way in which you use it, when you use it, and what you use it for.

If you look at the slide on the right, you will see a typical daily profile, at least a, a nine to five or an eight to six daily profile, and in that profile you will have a baseload, or a consumption typically that will occur regardless of the time, overnight electrical consumption is very common in industry and, and an area that needs to be eliminated. And then during the day, the consumption rises very, very quickly to a pique demand, and then there may be variations throughout the day. And the load factor, which is the ratio of typical demand to maximum demand, it needs to be highest, or larger, a good load factor, if you want to avoid charges for pique consumption, and for out of hours consumption. The maximum demand, you can limit by ensuring the use of soft starts, electronic starts, inverter starts, as preference, or staggered starts for larger motors, and drives, and electrical equipment that's larger electrical equipment. You need to

avoid operating that equipment wherever possible during the pique national consumption periods, and then out in Northern Ireland that is four till seven during the winter months, when there is a much larger demand placed on the-, on the, the, the grid as whole, and where charges have to be raised to discourage unnecessary use. Where it's-, where it's practical to do so, you should always correct the power factor, but there are some economics and practicalities associated with that, and we can look at in questions if, if required.

You should always consider process optimisation, doing the same thing with less. Now that sounds virtually impossible, but of course motors are generally oversized and therefore have running losses that you don't need, they're oversized generally to overcome big direct on-line starting loads, but that can be overcome, as I said earlier, with inverters or staggered starts, and so on. So consider process optimisation, and you should have very robust procurement policies for motors and drives. Motors and drives consume about 60% of power in industry, and for example, rewinding a motor, you can lose somewhere between 10% or 15% efficiency without really understanding why or knowing about it even if you don't have a monitoring system in place. And manage equipment demand with presence detection, for lighting as an example, and we'll look at that in, in lighting in a moment. So these are the key options you've got for trying to reduce your cost. In respect of tariffs, if you're a larger user on the commodity element of your bill, that's the bit that the supplier makes the profit on, there would be an opportunity to negotiate hard on that. For smaller users who may be tied to a general or night time tariff, but there are ways of moving, or could be ways of moving your production outside of a, a, a normal day, and therefore making use of night time electricity to reduce your costs.

You need to be flexible, or more flexible, with production these days, and you need to plan and manage production to make the best use of your tariff. Whatever you do, you need to conduct a load survey, and analyse your half hourly demand. Now if you're over 100 kilowatt consumer, then you will be able to get that half hour demand, that sort of basic version of it, from your supplier, and that's going to go a long way to understanding how electricity is used, or when it's used. I would encourage sub-metering every significant energy user because energy sub-metering is now very, very cheap, and IoT metering means that you can bring this up onto your phone for example. As I said earlier, manage your power factor, and monitor and target your electrical performance, understand when and what you are doing. If you're a large user, you're currently considered dsu demand side production participation, but as time goes by, and as the RP7 price period is encountered for the Northern Ireland electricity networks, there will be opportunities at smaller scale under that RP7 roll out.

So demand flexibility is a big, big feature of the new RP7 roll out for Northern Ireland networks. Now metering, monitoring and targeting is probably-, and I moved this right up the agenda, is probably one of the most important things you can do. Metering, monitoring and targeting is a system that allows comprehensive understanding of how-, of how your energy is consumed. You can consider it as just like having a trip computer for your business, the trip computer in your car because what you are doing is calculating the business MPG, the miles per gallon, or the kilowatt hours per widget, or the kilowatt hours

per working hour of your business. And afterwards it's a means of detecting change in energy consumption, it will allow you to run more efficiently. If you don't know what you are using, or you're not metering or measuring what you're using, you cannot, simply cannot, control it, it's like driving a car without a speedometer, an MPG indicator, a fuel gauge, and so on.

You need this instrumentation in your business to understand what you're doing. So set up a simple global KPI, a key performance indicator, now as you say that could be kilowatts per widget, or kilowatts per working hour, measure your performance, derive the MPG equivalent for your business, set some targets, and improve that performance, try and get the, the MPG up a bit, and track that benefit. So MM&T, metering, monitoring, targeting, is a mechanism for continuous improvement. And if you look to the right here, here's an example of dashboard, which is very appropriate terminology, a dashboard built Power BI for a water treatment company, and water treatment works, and we can see that we're running quite efficiently this day. And more recently, because we're all in the green in the bottom graph, we have made some significant savings. So there are many different ways of statistically analysing the performance of your business and reporting upon that, but what I would do is urge you to get the Invest Northern Ireland guide on this subject matter, and get specialist I & I support to help you set up a proper MM&T system. Moving on to compressed air very quickly, compressed air is the most expensive utility you have on site, 50% or more of the power input is wasted as heat. So first thing of course is to measure the leakage and stop it, and that's regularly done, we can look at that again in question time, or I would urge you again to look to Invest Northern Ireland and look at their compressed air management guide for industry. Where you have a low pressure application, or a cooling application, or something similar, then do not use compressed air, use blowers instead, it's cheaper and much, much more cost effective. If you can, reduce the pressure because that will stop the compressor running on as long if it's got a fixed, fixed head air end, but more power is required for more pressure.

So if you reduce the pressure, the power reduces accordingly. In the case of the distribution system, if you have an older black iron, well it's actually steel but black iron distribution system with corrosion inside and water lying in it, then you will be losing energy around that system. And one obvious way to optimise that is to replace it with a low friction loss (mw 10.43) or an aluminium, a proprietary aluminium system, put together an aluminium system. That serves two purposes, (1) excuse me, it reduces the friction loss, and (2) it will allow you to operate it at a slightly lower pressure. Whatever you do, you should monitor the use of compressed air, and I'm not talking here about measuring the, the, the physical flow of air, what I'm talking about is putting on an electrical meter onto your compressor so that you know when it's running, particularly to ensure it's not running during the night if you-, if you've not got production at night. So measure the electrical consumption of your compressor to understand when, how, and what is happening. And lastly on this compressor, and a little, sort of, overlooked fact is that the volume metric efficiency of the compressor, at least a posi-, placement, screw compressor, will change dramatically with air temperature. So if you draft in air at high temperature, then the performance goes down. And four degrees C roughly will equate about 1% reduction in performance. The waste heat compressor could of course be used to heat buildings, and heat use in buildings for space heating and so on, there are some obvious things that you can do to, to save money, reduce the temperature for one, two degrees, a human cannot detect an air temperature change of, of less than two degrees.

So you can safely go from 21 to 19, and nobody will be any the wiser, but that will save you a significant amount of fuel during the year. Insulate the building, the most obvious answer, and that's well known about, but the, with, with a well insulated building, it is a pointless exercise if the building is not well sealed, in other words, air infiltration can permeate the building, air infiltration or exfiltration removing the heat that you put into it, and sealing the building is as important now, if not more so, than insulating the building. By that I mean window frames, door frames, plug sockets, pattress boxes, sealing round skirting-, every conceivable gap or entry that allows air into the building. Gas fired boilers now far more efficient than anything else, a premixed modular gas condensing boiler can have a gross efficiency close on, or even greater than 95%. However, all of that is worthless unless you control the hours, and in controlling the hours, you really ought to be optimising and compensating the control, again very easy with modern boilers, optimising allows the boiler on and off switching to be reflective of the actual temperature in the building, or residual temperature in the building, and the ambient condition, and the compensation control allows the flow temperature to be set in respect of ambient conditions. And all of these serve to reduce further the energy consumption that you're going to be using in the building.

Lastly if you have a BEMS, Building Energy Management System, then please ensure that it's properly used, it's a very expensive time switch but in most cases that's what a BEMS simply is, it's used as a time switch when it can do so, so much more. Looking briefly at heat, and hot water, and steam distribution, again minimum temperature and pressure for generation, insulate the pipework and fittings, that can be-, that's the often overlooked item, with huge savings to be had there normally. Recover the condensate under all circumstances, if the condensate you feel is contaminated or has a high conductivity, then put it through a local plate heat exchanger, at least recover the heat from it. Obviously it's better if you can accurately recover the liquid, the actual treated condensate. Generate, never generate hot water with steam, you're probably looking at a overall efficiency of about 50% there when you can do it with direct fire gas boilers are something well over 90, as I said. Process heat, reduce recovery use, there will be opportunities for process heat recovery in almost every circumstance, compressor heat recoveries is a good example, and where that's not possible, then we might be looking at integrated process heat recovery, and a good example of that is the use of an economizer in a flue gas heat recovery.

Overall with heating and heat distribution systems, things like insulating pipework and fittings have definitely got a payback of less than one year, and other more complex processed heat recoveries are typically about three years, but generally speaking, there's somewhere between 15% and 20% savings potential in most heat distribution systems, or process heating systems. Lighting, very quickly touch on that, there isn't any solution for every application, LED lighting does need capable design, and the critical bit here is getting the lux level at the workplane right, lux is the lumens per metre squared at the workplane of let's .9 metres above the floor. You have to consider the lumen output, the ratio of the light output that is going to go to the place that you need it, the downward light, light output ratio, the colour rendition, LEDs have very (mw 16.32) output, unless the LEDs themselves are coated, so fruit and vegetables may look a very different colour under an LED light than they do under a daylight fluorescent, and the luminous intensity and directionality. Now luminous intensity is the LED has got a very small

area but a very high luminous intensity, so if you look at an LED torch for example, it looks incredibly bright, but actually when you shine it to see where you're going, you find it's about as much use as an old candle. And really you've got to be very careful with LED design to get it right, and that's not something that every supplier understands, whatever you do, use an employers risk assessment.

Don't be having inappropriate lighting, or colour rendition, or, or even control switching in things like switch rooms and stairwells because if there's an accident, you'll get sued for not having established, as an employer, a safe system of work. Savings typically between 35% and 50% over conventional lighting, and by conventional lighting, I mean older fluorescent types, T8s and so on, and the sort of controls we're talking about here are presence detection PRs, microwaves, both of which have differences and pros and cons. Simple time switching, daylight harvesting solutions are possible where the lighting responds to the ambient lighting input. And it maintains a constant lux level, or combinations of those. And certainly where you have a BEM system, you can integrate all of those controls or some of those controls at least and the time switching into the BEMs to improve your lot and overall, as I say, you should be able to make somewhere between 35% and 50% over typical lighting solutions. Lastly, but not least, fuel efficiency in transport, vehicle choice is important. Diesels are expensive to buy, expensive to maintain but cheap to run or relatively cheap to run because they are very, very fuel efficient. Petrol cars, less so, or vehicles or less so, less to buy, less to maintain but the MPG and the CO2 production is much higher.

The electrics and hybrids are extremely expensive to buy, they are less expensive to maintain if you don't take the cost of battery replacement into account, but you really must consider whether, you know, you're a leasing option or whether you're a buying out option completely because the battery could be a very expensive limited life component of the car, up to 80% of the cost of the vehicle. So, you need to do a very careful Capex vs Totex assessing. Driver training though is the key-, the key thing for all energy efficiency and transport. If you're operating something like a fleet of excavators or quarrying equipment, then an anti idling policy, you'd be surprised how much fuel is consumed by idling vehicles and actually idling policy would be part of that driver training.

Vehicle maintenance of course is essential, the Freight Transport Association recognised working lecture would tell you that even a small trailer, wheel misalignment will result in massive tyre struggle and fuel consumption. And lastly on that, in cab telemetry and logistics planning are a means of ensuring the best route match and the best load match and I don't know if there's a courier company in the UK now who wouldn't be working without in cab telemetrics or a logistics planning. The driving training bit, that's the key bit. Reduced accidents, reduced insurance claims, improved MPG, reduced fuel costs, reduced maintenance costs and potential savings of 7% to 15%. On a big fuel bill, that's a lot. Those figures are from the EST and from logistics which used to be the FTA. So, that is what they are-, what industry is experiencing in terms of saving. So, I had to rattle through that at high speed to cover off all the areas for everybody, but we can answer and look at specific questions in the questions, but my conclusions would be that there are still significant opportunities for saving. Most businesses have the potential-, the potential to look at about a 20% saving, but you need concrete energy management plans in place,

concrete policies, concrete drivers to achieve that. And you cannot measure-, you can't save what you don't measure or you don't meter. So, you must institute an MMT system no matter how difficult, get that MPG for your business and use your business KPI. And finally on that all, the most important thing is to use INI specialist support to get that to happen. Right, thank you for your time this morning, I hope that was useful.

**Jim Clarke: Thank you very much for that, Alastair, a very comprehensive, very informative presentation. I would like to introduce you now to Dayna McCreadie, who will give you information on advice on tariffs. Dayna works for the Consumer Council and will provide you a guide on what to do about tariffs in this current very high energy environment that we're all in, thank you.**

Dayna McCreadie: Good morning everybody, my name is Dayna and I work with the Consumer Council in the energy policy team. So, the Consumer Council, just to give you a quick overview of what we do, is the statutory consumer body providing consumers, both domestic and small businesses with advice and guidance in relation to energy, post, transport, water and food affordability and accessibility. And so today you're hearing about different ways to reduce what you're using in your business and I'm going to show you some of the tools that we have available to help you. So, we have a range of online tools and advice to help small businesses reduce your costs, and depending on the type of business you have, you may find our tools for the domestic consumers also helpful, or even just for yourselves at home. These tools include information and advice on energy prices, your water bills and appliance running costs. We can also support you if you have complaints with the energy bills, water, post and transport. We are a designated super complaints body and we have statutory powers in relation to billing disputes, complaint handling and performance standards.

So what can we do to help you reduce your energy costs? You are probably all at different stages of that journey and my number one thing when it comes to reducing your energy bills is to go back to basics. So consider an audit of what you're using, going back to what Alastair said, metering, monitoring and targeting, look at what you're using. So first of all look at your energy bills and what they're costing, look at your equipment, your appliances, your machinery and how much they cost to run, and then look at what times you're using those things, and I'll come back to that in, in a moment. So the first thing to do is to look at your energy bills. Check how much are your bills in money and in kilowatt hours. Are your bills accurate, are there any estimates in there, and are you getting billed correctly by your energy supplier? Then check are you paying the best rates for your energy cost, and that's where we come in. On our website we have an energy price comparison tool, one that's specifically for small businesses, so this is for businesses using up to 50,000 kilowatts of electricity a year or 73,000 kilowatt hours of gas a year. They allow you to compare the different tariffs and suppliers that are in the market to see if there are cheaper rates available for you, both for gas and electricity. You simply put in your kilowatt hours, your tariff type and the tool will list the different options available to you. How much you will save will depend on how much you use and where you are currently in terms of your tariffs, but there are price savings of up to 40% shown on our tool currently, so there is scope for movement there. Then you need to think about things when you are shopping around.

So bills and tariffs, the first thing you need to think about is what is your tariff type? There are typically three types for small businesses when it comes to electricity, we've got the Popular which is one flat rate, you pay the same no matter when you use it, Day and Night with cheaper rates at night time, and Weekender which gives you cheaper rates at night and at the weekend. Which is best for your business depends on your business and when you use the most amount of energy, so think about that, that's why you consider when you use your appliances in your audit. You should also consider whether a fixed rate or a variable rate is best for you. So fixed rates give you stability so you know what rate you'll be paying in advance, it can benefit you if the wholesale costs go up after you sign up, but it can mean you're fixed at a higher rate if the wholesale prices come down. Variable rates check-, variable rates track the wholesale market prices so can go up and can go down. While it does mean they'll go down if prices drop, it does leave you exposed in what is currently a very volatile market. When it comes to signing up to a new contract always check the terms and conditions thoroughly, how long as you signing up for, notice periods, exit fees, deposits. And finally, if you are struggling to pay your bills, our advice is always to speak to your supplier, they'll be able to work with you to try and find a way forward. You can also contact Advice NI who can help small businesses with debt advice, and we're there if you're having any difficulties dealing with your supplier. On our website we also have weekly survey of home, heat and oil, and fuel prices.

So these price checkers are published weekly and they can be used to benchmark prices and allow you to shop around for the best price when it comes to oil and petrol and diesel, and potentially make some savings there. My last slide touches briefly on improving energy efficiency. What you can do to make your business more energy efficient will depend on the size and type of business you have, but I would advise a similar approach to your energy bills. Start with the basics, lighting, thermostats, insulation, things that Alastair has also covered. Our website has some top tips on running cost to look at. The Energy Saving Trust also has some information on how to save energy and NI Business Info has some checklists to work through. Our energy supports are very much help yourself tools and advice on our website, but we also have a phone line for those not online. Finally, we offer a water bill health check, so while it's not directly energy related, it is a free service where a member of our water team can give you individual advice on your water bills. They will speak to you directly, run through your bills and check that you're being billed correctly, and identify if there are any savings you can make. They do the hard work for you and over the last couple of years have helped over 300 businesses and identified savings of over £225,000 in water bills. That brings me to the end of my presentation. You can find all of this information on our website and I've added our contact details to the slide deck. Thank you for your time this morning.

**Jim Clarke: Thank you very much Dayna. That was an excellent overview of what's available from the consumer council and also a basic introduction to what, what companies and individuals can do to reduce their energy bills and help the environment. Our next speaker is Geoff Crawford of our Operational Excellence team. Geoff will introduce us to what can be done to reduce, say, the movement of materials, movement in a factory or commercial setting, which in turn will reduce energy bills. Thank you Geoff.**

Geoff Crawford: Good morning everybody. Welcome to this introductory session about applying lean thinking to run your business more efficiently. My name is Geoff Crawford and I am an operational excellence coach within the Operational Excellence solutions team in Invest Northern Ireland. So the introduction to lean process improvement will give you an understanding of how lean thinking can be applied to make a company like yourselves more competitive. It will mainly focus on learning to say the eight wastes of lean and applying some of those lean practices in your business to reduce those wastes. It will also look at practical ways of applying lean thinking to reduce energy, that energy waste, and some of the lean tools that can be applied to reduce the energy consumption. At the end it will cover also how to get additional information on the material covered today and how to contact the team if you want to engage with us further. So, how does work get done in your business. Basically you have a process with inputs, resources that are managed in a way to produce a product or a service to a customer. Lean is basically doing more with less of these, less resource, less energy, for example. So what are we actually trying to achieve by using this lean thinking? According to Shigeo Shingo of the Toyota Production System, the purpose of process improvement is to make our work and our business processes easier, better, faster, cheaper, in that order of priority. At a high level what we need to do is engage our teams and lean is all about people, it's all about engaging them, we want to increase motivation and involve them in making the job easier to perform. We want to make it smarter rather than harder. When the job becomes easier to perform we make the work better by increasing the quality or the right first time.

Hence then the easier the nature of the work with that increased right first time means that the work will naturally become faster. If we achieve the easier, better and faster then it starts to reason that we'd get more work done cheaper also, however, if we chase the cheaper without the others you'll not get your sustainable improvement. Lean is all about making life easier for the employee, making it better for the employee, improving the quality. So we mentioned about the eight wastes, so what are they? Waste consumes time, money, energy and people resources without adding value to your customer. Focusing on the 90% of activities in your, your business that may not add value to your customer, in particular the eight waste, will help your business improve their efficiency. The TIM WOODS acronym helps to remember these. You've got transport, inventory, motion, waiting, over-production, over-processing, defects and skills, particularly the unused skills of your workforce. Let's look at a practical approach then to-, you could use to eliminate the waste in your process. First of all I would say first of all understand the activities that are used in the process, identify the resources involved in carrying out the process, go and see for yourself what's really going on and where the activity is, is taking place. Do involve those actually doing the process as well as others that particularly have the power to change the process. Look particularly for the hidden waste using the TIM WOODS acronym I've just explained and categorise the wastes. Work with the facts and not the assumptions. A waste walk is a good structured approach for doing this. So here's an example of a simple waste walk template. Understanding the, the eight wastes, i.e. TIM WOODS, will help you identify those wastes within your own work area.

First of all, categorise the wastes, so for example a local wood processing business had breakdown issues with its wood profiling machine. Someone then had to report the fault, which is motion, and then wait for an engineer to fix the problem or the fault, again motion. Meanwhile, the paint shop were still waiting for



a profiled part to paint so they can finish off the order. Once you've done that, the next step is to define the priority of removing the waste based on the impact it's having on the process, that's going to be either high, medium or low. The next step then is to help understand, estimate the level of difficulty to eradicate the problem. Is it easy to do, is it medium or is it hard? In this case, the company, the company implemented TPM, total productive maintenance, and reduced the downtime from an average of two hours per day to two hours a month. Output increased by 20% with no extra cost. From an energy point of view, think about the energy that is wasted during these breakdowns. The lighting for profiling and painting, heating in both areas, manual resource, operator and the engineer, and by the way the machines are still switched on, consuming energy but not adding value. So let's look at applying lean thinking to reduce specifically the amount of energy used in production and to increase the resource and productivity. By eliminating waste, such as unnecessary processing and transportation, businesses also reduce the energy needed to power equipment, lighting and cooling. Without explicit consideration of energy waste however, lean may overlook significant opportunities to improve performance and reduce costs.

Energy is a vital input to most production processes and value streams. Energy waste increases the cost of businesses, energy wastes however are normally hidden in the lean, eight lean wastes as shown in the table. Waiting, for example, costs, causes waste to energy from heating, cooling and lighting during production downtime. By thinking explicitly about unnecessary energy use as another deadly waste, applying lean can significantly reduce costs and enhance competitiveness, while also achieving environmental performance goals. Application of the correct lean tool technique to each waste as shown in the table can greatly reduce the energy consumption by reducing or eliminating those wastes. For example, applying 5S to a work area can significantly reduce motion, effort and energy from that process. Installing a simple Kanban between stations, for example, can reduce over-production and waiting, hence reducing energy used in those ways. While there are a great number of lean tools, here are six lean tools that can play a significant role in the reduction of energy consumption. These tools are Total Productive Maintenance, SMED, Single Minute Exchange of Die or quick changeover, Visual Workplace. TPM for example is the systematic care and maintenance of equipment which increases the life of machines and reduces the machining downtime, therefore with proper equipment and system maintenance facilities can reduce manufacturing process defects and save an estimated 25% in energy cost. A local company which I've just finished working with by applying these single minute exchange of dies were able to reduce their changeovers of their bottleneck profiles from twenty minutes to ten minutes. This resulted in an, an increase of an output by 10% and a reduction of 50% of energy and labour wasted during this non-productive time.

There's also Standard Work, Mistake-proofing and Right-Sized Equipment. Standard Work for example is a set of work procedures that establish the best and most reliable method of performing a task or operation. Work procedures maintained at each work station, incorporating energy reduction best practices can reduce the energy waste. There are a number of tools and concepts which are, are employed throughout the application of lean to increase the company's competitiveness. Obviously we can't cover them all here today but here's a list of some of those tools and principles along with links to tutorials to give you a better understanding of what they are and how they can be applied to help a company be more productive. These are available on the Invest Northern Ireland Operational Excellence website, which we

will give you a link to at the end. Here's also some info on who we are and what we do. As I said, we're the Operational Excellence Team, we're a team of trained coaches with numerous years of business experience across a wide range of sectors and sizes of companies. We work with Northern Ireland companies to improve their productivity, profitability and competitiveness. So, final slide, if you have any queries then about applying lean thinking to your business or you want some additional information about the support we offer then please get in touch by using the email address [opexquery@investnorthernireland.com](mailto:opexquery@investnorthernireland.com) or visit our website [investnorthernireland.com/support-for-business/operational-excellence-solutions](https://investnorthernireland.com/support-for-business/operational-excellence-solutions). And that's all from me on this application of lean, to be a more efficient business. Thank you.

**Jim Clarke:** Thank you very much Geoff, that was very comprehensive and thorough introduction to lean sentiment and how energy efficiency is inherent to a successful lean programme in a manufacturing, manufacturing context. Excuse me. I would like to introduce you to the energy and resource efficiency team and what we do as a team to reduce energy consumption in a wide variety of sectors and businesses. The concern-, the-, these, these are introductions to the programmes that we run. The Invest NI energy-, sorry, the technical consultancy programme, it's free for up to 6.5 days free consultancy for clients and non-clients. Essential criterion is that the annual resource spend is at least £30,000. The client discusses a project or projects with a technical advisor, that would be myself or four of my colleagues. The advisor will then write a technical specification followed by tender submission for consultant appointment. The tender will be based on methodology that was submitted by the consultant and the price. The project is then completed after the-, after the work has been done and then report submitted and issued to the client. Next slide please. The resource efficiency capital grant, that is to reduce material consumption or increase material efficiency in the business. The next call will be in April or May of this year, excuse me, subject to budget. Up to 30% of grant support will be available towards project that improve material efficiency. The maximum grant will be £50,000 and applications will be competitively assessed for payback, position on what's called a waste hierarchy, a commitment to invest the balance of funding, and overall correct information on all applications submitted.

Now, all projects are initially discussed with a technical advisor in advance of an application being made, so if any companies or individuals are interested in making an application, it's extremely important that they discuss with the technical advisor on what the project will involve and how to proceed. Next slide please. The Northern Ireland energy, energy efficiency scheme, now, that-, the launch date for that, and we hoped that would be some time this year. The terms of reference are still being finalised. Now, just to give you a point of a comparison, the previous scheme was the energy efficiency capital grant and that ran from June to October 2021, in that case the maximum grant was £80,000 and the-, at 20% of overall project cost. At that time company size was not a restriction. Now, that was a COVID grant and basically the aim of that was to try and get companies back on their feet again but, as I say, the terms of reference for this energy efficiency scheme upcoming, as I say, that has to be finalised and in terms of what grant support will be there and also the technology scope that will be covered. Next slide please. So we also carry out a sustainability and carbon footprint assessment for businesses. Sustainability assessments in terms of the overall environmental impact of, well, of the company's operations and also separately from

**that a scope one, two and three carbon emission assessments in line with the Greenhouse Gas Protocol. We also-, and then hopefully issues and difficulties in assessing carbon footprint by Scope will also be highlighted, and again the tactical advisor will discuss with the client what those issues and difficulties are in order to give a realistic assessment of what the scopes one, two and three emission assessments will be. Next slide please.**

**So what's been the benefit for business of these various schemes that we offer? From the period 2015 to 2022, our projects have identified at least £50 million worth of cost savings, and of that-, and of those identified savings £12 million have actually been realised in terms of cost savings. What I mean by that is the investments that were actually made as a result of the identified savings that were made. And for the period 2020 to 2022 alone identified carbon savings of over 27-, 27,500 tonnes. So hopefully that will give you an idea of the value and the worth of the projects and the scheme-, the projects and the programmes that we offer to business. So that's the end of my short presentation, so I'll hand over to my colleague, Bernadette Convery who will handle questions from the audience.**

Bernadette Convery: Thank you, Jim. Okay, so we have a few questions here for the speakers from the audience and the first one up is for you, Alastair. So, 'What do you say to a client that you've been proposed metering and monitoring and they ask you what is the payback?'

Geoff Crawford: Well, metering, monitoring and targeting itself is just like having the, the trip meter in the car. So technically there is no payback to that. What it does do is it forces you to think about the way in which you're running your-, driving your car and take your lead Wellington off the accelerator pedal. Typically in industry, savings generated just by the awareness derived from a range between 3% and 5%. So, you know, it's, it's a small price to pay, if you like, for a large saving but the, the (inaudible 46.31) identifies the problem. There may be other installations or installations associated, required to get that, to derive it all, but typically 3% to 5% and I would suggest that, you know, the-, setting up an (mw 46.46) system, the time involved collecting the data, it's always going to be a payback of less than one year. It's, it's, it's just common sense really.

Bernadette Convery: Okay, thank you. And next up is one for Jim. Now, there were a couple covering the same topic here so I'll just ask the one. So, 'Any prospect of the reincarnation of the energy efficiency loan fund? It was the best scheme Invest NI had in their energy portfolio and it would be very useful in these times and massively cost effective at current energy costs for businesses.'

**Jim Clarke: At this point in time the scheme is still being developed so we cannot say whether or not a loan scheme will be back, or a grant scheme will be back in that case. If that's of any help.**

Bernadette Convery: Okay, thank you Jim. So the next question is for Dayna. So, 'Where do you find the

information needed to use the comparison tool, and how do I know how many kilowatt hours I've used?

Dayna McCreadie: If you basically go to your energy bills, your last previous bills and you should be able to find the information there of how many kilowatt hours you've been using. If you can't find that easily there, if you go to your energy supplier they'll be able to tell you what you used over the last twelve months to give you an idea of that.

Bernadette Convery: Okay, thank you. And just another one there for you Dayna that's just come in. So, 'Can you recommend a cost effective energy provider for home use only? The current one we are using zaps so much energy. Please help.'

Dayna McCreadie: Okay, so if you're looking for domestic tariffs we have a tool much similar to the, the tool for the small businesses but for-, specifically for domestic tariffs. So go onto our website and you'll be able to find the tool there. If it's about energy efficiency, so it's about how much energy you're using, there are some top tips on there, on our website as well, for domestic and how to save energy there too.

Bernadette Convery: Okay, thank you. And Ali, there's another one here for you. So, 'To prevent the spread of COVID we've been advised to provide more ventilation. You just advised a sealed building as growing, factoring and reducing energy. Any thoughts on that?'

Geoff Crawford: That is a difficult one but, but if you are having to exhaust warmed air from a building then the obvious solution would be some, sort of, heat recovery system. Now, there are various different types of heat recovery system but if COVID is going to be an issue here then-, and I'm presuming this must-, I'm thinking this is maybe a hospital or a, a auditorium or something, then you could use an indirect heat recovery system which would be essentially a heat pump. So you'd exhaust the air out of the building at nineteen or twenty degrees and you'd use a heat pump to recovery that heat, to pre-heat the air, controlled ventilation into the building, thereby limiting the amount of heat loss.

Bernadette Convery: Okay, thank you. And Geoff, there's one here for you. So, 'Can lean be applied to the service industry?'

Geoff Crawford: I think (talking over each other 50.18) . Yes, it can be applied to the service industry. The, the key thing with lean was the-, because it was born out of the typical production system it's more to do with manufacturing but it's lean thinking and it's also looking for those eight wastes within even an office or a service. There is slightly a different way of, of categorising those wastes but again, again implying the same thing, looking for waste within that business so we can help with that also.

Bernadette Convery: Okay, thank you. And Ali, there's another one here for you. So, 'Why would an

enterprise sign up for 100% renewable electricity when they pay the maximum gas price, and the wind and sun are free?' Ali, I think you're on mute there.

Alastair Nichol: Can you repeat that question?

**Jim Clarke: Yes, no problem, so, 'Why would an enterprise sign up for 100% renewable electricity when they pay the maximum gas price, and the wind and the sun are free?'**

Alastair Nichol: I've obviously got the wrong end of the stick there but, look, the, the-, ultimately if you are on a, a conventional tariff where the electricity is generated by gas plus some renewable plus some coal plus some peat or whatever and you can-, you can-, you can actually get the mix off the regulator's website, ultimately if you are trying to move to a-, either a carbon neutral position which is a scope one and two carbon neutral position, or a net zero position which is where you address the scope three as well, and you are intending to achieve pass 2060, or the sustainability targets initiative and a net zero target, then you are going to have to do something about bringing your carbon footprint down. And one of the ways of doing that is of course buying into a green tariff. The other is offsetting if you cannot make the efficiency improvements that you need. But offsetting ultimately could be as expensive as buying into a green tariff. The price of carbon is rising dramatically and I think the last look for most offsetting programmes you're probably looking at about €50 a ton, so-, and that will go up obviously as, as more and people-, more and more people have to engage to get to, to achieve carbon neutrality. Now, you could do nothing of course, but the problem with doing nothing is that more and more companies when selecting or, or operating their procurement policy are looking to see that the suppliers are doing something about carbon. Certainly in the public sector, for example, 20%, up to 20% of the marking will be how are you addressing carbon neutrality, how are you addressing your procurement, your upstream carbon-, embedded carbon in your carbon chain, your carbon footprint, how are you dealing with that? Now, if you can't answer all of those questions then it's going to make life ultimately a bit tougher.

We're all in the same-, the same boat so doing something now-, I, I, I'm not sure I really completely understood the question but I hope I've answered it. If, if they want to rephrase it or something I can-, I can probably have another shot at answering it but hopefully that gives you some steer.

Bernadette Convery: Okay, thank you. And Jim, there's another one here for you, I think you're probably best placed to answer this one. It says, 'Is there anybody that can come out to advise a small business on energy use?'

**Jim Clarke: Yes, that's the-, that service is available to anyone, either Bernadette, myself or, or other colleagues on the energy-, on the team (inaudible 54.22) measures, so just forward your details to myself or Bernadette and we'll engage with you and come out as soon as possible.**

Bernadette Convery: Thank you. And another one probably for you Jim here. 'Are there any grants for installing solar panels to your company's roof?'

**Jim Clarke: Unfortunately not at the moment.**

Bernadette Convery: Okay, thank you.

Alastair Nichol: But-,

Bernadette Convery: Sorry, go on ahead there Ali.

Alastair Nichol: No, I was going to say but, but it has to be said that the increase in the electricity prices made solar installation, even solar with battery quite economic now. Certainly the payback's down around five or six years for straight solar installation, so it's improving, it's improved dramatically.

Bernadette Convery: Okay, thank you. So this one is probably for you Ali. 'In the current market, what are the prospects of energy companies offering fixed tariffs again?'

Alastair Nichol: Well, I can only answer that imagining that I was an energy company and the, the, the, the current situation, the volatility in gas price is not gonna go away for a very long time and, believe it or not, renewables and the, the invasion of renewables is gonna actually continue to drive volatility in gas price, for example. So until a long, long way from now when, when, you know, we've transitioned off fossil fuels, and I'm long dead and gone, I, I, I think they'll be very-, they'll be much less wish or propensity to, to use fixed tariffs for those reasons, because of the volatility in the market. If you get that wrong then as an energy company you go bust, which is exactly what happened, you know, at the end of-, a-, the, the-, a year ago. So that's the only-, you know, my crystal ball is as good as anybody else's crystal ball. My crystal ball says lots of market volatility. What we do need to do is to get to grips with the fact that we are paying the highest prices for energy in the-, almost anywhere in the world and we've lost control over our, our fuel, oil and energy resources, effectively.

Bernadette Convery: Okay, thank you Ali. I'm just coming to the time here so any questions that haven't been answered we will hopefully take those offline and Jim, I'll just hand over to you here for closing off. Thanks.

**Jim Clarke: Yes, thanks very much everyone for attending this morning. Hopefully at least some of your questions have been answered and obviously if you have any other questions contact any and**

**all of the presenters (inaudible 57.35) myself. And following on from the last query that was made to myself, if you have any issues or any energy efficiency issues that you want to discuss with any of the technical advisors by all means get in touch. So, as I say, thank you very much for attending and good day to everyone.**

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