**James Gaede:** Hello everybody. I'm James Gaede. I'm a research manager at Efficiency Canada. For a long time, I've been the project lead on our annual scorecard report, but I've also done some other research in various areas, one of which I'm going to talk about today, which as you can see from the title is on some research that we've done at Efficiency Canada, looking at strategies to bolster industrial energy management strategies in Canada.

So a little bit about this project. At Efficiency Canada, we like to focus our research and advocacy on the broad set of policies and institutions and actors that together comprise what we call like the policy system for a given issue area. Often it's the case that there's multiple policy systems maybe overlapping that govern a particular area.

So the issue that we're looking at in this research is industrial energy management. And I'll speak a little bit more on exactly what that is in a bit. There's several policy systems involved in this area including provincial and federal climate and industrial policy, utility systems and demand side management programs, and then also like this evolving area around corporate climate risk reporting and E S G or environment and social governance and guided in practices.

So the objective of policy system research as we think about it, is to identify challenges and opportunities that arise out of that, specific institutional kind of arrangement for a given policy area, not necessarily looking at how one or another actor, sees the particular area.

And so that's what we've hoped to accomplish in this.

Okay. So before I go any further, just quickly acknowledgements. This research was funded by Scotia Bank's 2021 NetZero Research Fund. And I'd also like to thank all the experts that we consulted during the course of doing the research. And particularly our peer reviewers for having a close look at the draft report and providing some very helpful feedback along the way and some clarifications on a lot of issues.

Those peer reviewers include as you can see here, Michael and Kevin, who are chair and co-chair of the Canadian Technical Committee for ISO 50,001 development, and more on that in a bit, if you're not familiar with it. And also Jess Burgess at Ocon who's an expert in energy management program implementation.

And before I forget, I should mention, The companion report that contains all the research that this presentation is on is due to to release in April. If you are interested in being kept up to date on the process there I think you can probably email me and I think Alison will put my contact information in the chat, but it's also at the end of the presentation, so just hang tight if you need to write that down.

Okay, quickly what's the agenda that I have for today's discovery? First, we're gonna look at what the problem is that energy management kind of sits within. Then we'll look at how energy management can help address that problem and look at a little bit about like the current status of where energy management is in Canadian industry.

Third, I'll explain three interrelated policy system challenges that we identify limit the potential spread and impact and awareness of energy management practices in Canada. And then finally, I'll present a series of policy system modifications or strategies that governments industry and other policy system actors could follow to overcome these challenges and really work to create a culture of continuous improvement in industrial energy use and G h G emissions in Canada.

Okay, so moving on, what is the problem? Basically the problem is climate change, which is probably not surprising to most people. Industry in Canada, which consists broadly of the oil and gas sector, mining and heavy industrial manufacturing industries like cement or fertilizers or iron and steel manufacturing, but also light manufacturing, which includes wide range of things, food and beverages, textiles, autos, so forth.

Basically industry in Canada is very energy and carbon intensive. It's the single largest sectoral contributor of Canadian GHGs. And you can see here that it says 39% of Canadian greenhouse gases come from industry. That figure would actually be a little bit higher if you were to include the associated GHGs with offsite electricity use by industry.

So according to the federal government's 2030 emissions reductions plan, rapid and significant reductions are needed and imminently if we want to hit our targets for 2030. Basically oil and gas needs to cut their emissions by about 40% and heavy industry by about 28% from where we were in 2020.

Most of that will come from improvements in energy use. Direct energy combustion accounts for about 70% of industrial emissions. The remaining 30% comes from things that'll be harder to cut including industrial processes. And in the short timeframe that we're talking about, like up till 2030 the kind of novel production processes and things that are on the cutting edge probably aren't going to be really a big thing in that time.

So clearly this is a big challenge to reduce energy and carbon intensity. In fact if there was no improvements in the G H G intensity of the energy that is used in industry, which is to say no fuel switching or anything like that, hitting emissions targets in that 2030 reductions plan would require energy intensity improvements in industry of around 40 to 50%.

So this is what that looks like in chart form. The solid parts of the lines are showing the observed G h G emissions from the oil and gas sector, which is red and heavy industrial sector, which is the greenish color. And the dashed lines are showing the approximate kind of trajectory that'll be needed to hit those 20, 30 targets of the 2030 emissions reductions plan.

There's other sectors obviously that I cut out of this chart just to make it a little bit more readable. Notably the electricity sector has the steepest reduction curve to 2030 which will help, but maybe not so much when we're looking at these emissions. Cuz like I said earlier, these emissions observed here do not include that offsite electricity associated mission.

Okay, so the implications of this are that substantial improvements are necessary, and in fact, intensity improvements aren't gonna cut it. We need absolute reductions in energy use in GHGs in industry, independently of whatever happens on the production side. Another thing to note is that there's no single magic bullet.

Here, industry in Canada is highly varied. And there's different sectors tend to be geographically concentrated in different areas, so the types of solutions that work in one sector might not work in another. And then whatever prime government policies or programs are available might be available in one province, but not on another.

There's also, as I said earlier, limited near term solutions for addressing emissions from industrial processes. Things like hydrogen and carbon capture and storage and those kind of advanced production processes that I mentioned earlier. These probably aren't going to be very viable solutions to hitting those 20 30 targets.

In the long run to 2050 probably but in the immediate timeframe that we're looking at, probably not likely to play a big role. So that kind of leaves maybe a couple things, but particularly energy efficiency and electrification of other end uses that can be electrified.

So not necessarily the industrial processes. Now energy efficiency alone won't be able to solve the problem. A study from NRCan and the International Energy Agency from 2018 found energy efficiency could make a huge impact. Reducing emissions by about 25 megatons of carbon dioxide equivalent emissions by 2030.

Now the true figure's probably higher given whatever assumptions about what is or is not feasible in that study, which was done sometime ago now. But what it and electrification have in common is that they both are really about how energy is used in industry and addressing how energy is used is a question of ultimately energy management.

Okay, so that brings us to the topic. What is energy management and how can it help industry get toward its 2030 and beyond emissions target? Okay, so to start, energy management's not a thing, a single thing. It, it involves a wide range of practices and activities, but they are all generally connected to an end goal of identifying, measuring, and then controlling and improving energy use in organizations.

So it can involve things like conducting energy use audits or doing walkthroughs to identify energy saving opportunities, hiring energy managers, benchmarking your performance against other organizations and so on. Broadly speaking, energy management activities , they vary in scope, but they also vary in how technical they can be.

Organizations can look at, you could do a audit of a single system within a facility, but you could also do an audit of the energy use practices in the entire facility. You can focus on installing like Submetering hardware and other kind of technical systems to help measure energy use. But you can also focus on implementing general organizational, behavioral and operational practices and principles and protocols and stuff to influence the behavior of people in the organization and raise awareness. So there's a spectrum in both those areas. Importantly, energy management really varies in how systemic it is, right?

And that's a crucial point. By systemic, how comprehensive and embedded energy management is in regular business practices. So conducting like an A one-off energy audit of a single system with no kind of connected plan to improve it or means to evaluate that improvement is not really a system for energy management.

So what we're really looking at here is energy management systems, as they're often called, which is like a comprehensive collection of activities that aim to build persisting and goal directed energy management practices, and influence a general corporate culture for energy management to develop over time.

So critical to this idea of an energy management system like we see in other management systems things, is this idea of continuous improvement. So basically the idea of continuous improvement is that organizations, by adopting these management systems, are committing themselves to working toward continuously improving the thing that they're focused on.

In this case, energy use by following an iterative process of ' plan, do, check, act.' Energy management starts with planning, which in involves things like identifying goals, allocating responsibility in the organization for who does what, putting together teams, sometimes doing those initial scans and measurements and figuring out where the opportunities lie.

Then moving to the "do" phase, you implement some of the improvements that you've identified. , which is followed then by a rigorous kind of evaluation to ascertain how those improvements work. That's the 'check" phase. And then you look at the evaluations and you you evaluate what to do next, how to act on the, on what you found, and then you move back into the planning stage.

So this little image here and this slide comes from the ISO 50,001, which I shouldn't describe actually, now that I come to it. Like other management systems, there are standards to inform the development and maintenance of energy management systems in industry, but also commercial facilities.

So organizations that put in place such systems can then go and seek third party certification to, ensure that their system meets the standard requirements of what an energy management system is, and then also demonstrate to, their clients and whoever else that they have done this thing.

So the most prominent such standard for energy management systems is the I s O 50,001 standard of families. There are others. So the US Department of Energy took the lead several years ago in developing some related programs. Notably what was called Superior energy Performance, which is based on ISO 50,001, but incorporates additional requirements around performance reporting.

And then there's some recognition thereof of the amount of. Performance improvement that has happened. And then more recently, another program called ISO 50,001 Ready, which is basically like a self attestation that an ISO 50,001 compliant management system is in place but it doesn't really have any kind of third party certification. Here in Canada, NRCan recently established an I S O 50,001 ready program for Canadian industry and has put out and put some tools out to help guide industry and program implementers toward that goal.

Energy management, what are the benefits? So energy management can be the cornerstone of broader climate change and industrial policy strategies. Taking a strategic and systematic approach to energy management has many benefits both to the business itself, but also like throughout the supply chain and more broadly in society as well.

Studies have found that energy management systems can produce significant energy and cost savings. Ranging from 10 to 20% of energy savings in the first five years alone. Cost savings associated with the investment in energy management systems and the energy efficiency that results from it are among the most commonly reported benefits perceived by industry of energy management.

 Industry is not necessarily pursuing energy management for those things. So it's like a surprise about how much energy and cost efficiency can happen from energy management.

A 2021 study by the ACEEE in the United States, that's the American Council for an Energy Efficiency Economy, found that widespread adoption of strategic energy management practices, which is maybe I'll come back to that, but it's like a program design that's intended to facilitate energy management system development. So widespread adoption of strategic energy management practices could lead to substantial energy and GH h g savings at the highest level of technical potential that the AC looked at. Energy management alone could account for 19% of Canada's 2030 G H G targets for industry. Okay. Globally, a study by the Clean Energy Ministerial estimated that energy management systems could save 105 exajoules of energy and prevent 6,500 megatons of carbon dioxide equivalent emissions and save 700 million dollars by 2030.

Energy management systems also helped build capacity within an organization, within the facility as well which helps to ensure that any kind of future energy efficiency improvements that facility does, they're able to maximize the benefits of those improvements. Some program evaluations that we've found for this research showed that organizations with energy management systems tend to achieve significantly better energy savings from capital investment projects for energy efficiency than do organizations without energy management systems.

Finally energy management systems because they help organizations identify and measure and reduce their energy use, they can also help industry adapt to and prepare for these emerging requirements around corporate reporting for climate risk and also e s G reporting as well. And I'll come back to those topics a little bit in in a couple slides.

All right. Moving a little bit now, what's the current status of energy management in Canada? So the answer to that is it's complicated. There isn't really an easy way to measure or account for the extent of energy management in industry presently to say nothing of the impacts of energy management practices where they exist.

We could track I s o 50,001 certifications, though I will come back to why that's of limited utility. Several provinces have energy management. We've got range of energy management programs typically provided through utility demand, site management portfolios. But public reporting of from these programs is often quite limited.

Many are based around, is o 50,001 requirements as we've through research that we've conducted from the scorecard. But no programs really require certification. And there are some notable absences and provinces that don't have any energy management programs or did and no longer seem to be doing that, in particularly Alberta and Saskatchewan.

Alberta used to have some strategic energy management programs for industry. But they've wound down and Saskatchewan also had a program earlier, but it has also been wound down. Another angle on this one is that provincial and federal climate and industry policy, like the broad policy that's, related to climate change and how industry can adapt to it, doesn't really feature energy management quite as prominently as some of the other flagship endeavors.

The hydrogen strategy or carbon capture and storage. The federal government has long provided support for energy management. And actually recently just launched a substantially beefed up program that could help address some of the program gaps in certain provinces. And, we can speak about that a little bit later as well.

Finally, if you look at it internationally, look at policies and other advanced industrial economies for energy management. You can see while not only is Canadian industry generally a lot more energy intensive than these in these countries, those countries also have stronger requirements around industrial energy auditing and.

Okay, so this chart showing ISO 50,001 certifications by geographic region. The data is from the I S O itself. I know it's probably impossible to make out. There's no real easy . Maybe I just need to learn to make better charts, but I'll walk you through it. So the big block in the middle, the dotted one, that's Europe.

The EU enacted a directive in 20 11 requiring all industry to conduct these kind of periodic energy audits. But getting ISO 50,001 certified energy management system was an alternative compliance mechanism to avoid having to do that. And so you can see the impact of that policy. Now, way up at the top, there's an extremely thin green sli.

And that is North America. So basically ISO 50,001 certification in North America is not a big thing.

Actually, NRCan tracks certifications ISO certifications and according to the data that was available on their website, most recently may have been updated by now, I'm not a hundred percent sure. 19 companies were ISOs 50,001 certified in 2020 across 168 facilities. So that includes commercial facilities and in fact, Hilton Hotels accounts for 125 of those sites.

Now, this table to the right, that's showing unique company and facility facility counts for certain industrial sub-sectors in Canada, provided those facilities produced more than 10 kilotons of CO2 annually. So in other words, these are the country's biggest Single point source emitters of GHGs.

Now, I don't know, I hope the numbers are legible. But if you can see it, you can see that there are actually really not that many companies. And they produce the lion share of Canadian Industrial GHGs. According to this data, which is from the G H G inventory, 72% of industrial GH h g emissions comes from these 442 companies or roughly 1200 facilities. So of all 19, of those ISO 50,001 certifications, were industrial only 4% of industry has a certified energy management system in place. That is just a way of thinking about the data. I am not saying that is the case because no one know.

Okay. So to be clear, energy management isn't all about certification. And, maybe, we'll, we can come back to this later. These companies could very well have well-developed energy management systems in place, but don't bother with certification.

And you saw on the previous chart, ISO 50,001 certification is virtually non-existent in North America. But that is not to say that companies aren't necessarily doing energy management, but we don't track that in a rigorous way. And by we, like collectively in Canada.

So unlike with greenhouse gas emissions or there's also a national pollutant registry. There isn't any national public government administered repositories of like facility level energy intensity information or energy management plans or anything like that. And it's not like it would be very difficult to do, cuz there is after all only like 442 companies here.

Okay An implication of that is that, trends as they are happening in these fields of climate, corporate climate risk reporting and E S G reporting might eventually require or demand far greater transparency. Now this is a rapidly evolving policy area, and it's one which has been subject to no shortage of legitimate criticism.

I'm gonna quickly go through this. Within this area there's a distinction between standards or protocols that focus more on financial risks or financial health of the organization versus on the other side. Ones that focus more on the general impacts that a company is having on sustainability and society.

So in the middle is, this sustainability counting standards board which developed a series of standards. Four different industrial sub-sectors in terms of what kind of things would they want to include in their climate and sustainability reporting. That has since been integrated within another organization internationally called the International Financial Reporting Standards Body, in which this other organization called the International Sustainability Standards Board is housed. And so they've adopted that and are promoting the, that set of standards as the way forward. So in Canada, Canadian securities regulators are moving toward requiring more on the financial side the financial reporting, the climate risk reporting, and that's in the vein of this what's called the task force for climate related Financial Disclosure.

The T C F D. Those rules do not include anything specific about energy management or energy intensity reporting. So the, those SASB standards are now, they're in the I B they do for certain industrial sub-sectors. And in fact there is a Canadian Sustainability Standards Board, the c SB that's being established in Montreal presently to guide the adoption of those standards in Canada.

So that's energy management, it's benefits, and it's current opaque status. So what's holding it back? And, why don't we have a, you know what I would argue is a stronger and more functional policy system for industrial energy management.

So in our research we identify three broad things or challenges that are frustrating, more progress maybe on industrial energy management. First of is interests which is to say the interests of major stakeholders aren't really aligned toward that kind of long-term perspective. Now, that's not to say that each organization wouldn't benefit personally from continuous energy or continuous improvement in energy use.

And it's not also to say that they aren't interested in energy management. Rather what we're saying here is that the way that the institutions and policy systems are configured, that kind of govern this area in which the actors are operating aren't necessarily configured. So to align actors toward a long-term perspective.

So for example, the internal priorities of businesses are generally toward production. So to the extent that energy management might in interfere with production, it usually, it might o it often takes a backseat. And without an internal business culture that values energy management, there are risks associated with the policy interventions that we might use to push for it.

So a way you can think about this is you can lead a horse to water, but you can't make a drink. Requiring certification or maybe offering two generous of incentives. It can lead to this like box checking approach to energy management, which is to say business might, do what it needs to comply with whatever it, the rule is put in place in energy management system.

But there's no real commitment to maintaining it over the long. . On the other side, on in utility systems, the rules around demand side management programs are not necessarily set up to foster long-term collaboration on energy management. Energy management programs often struggle to be cost effective.

Although they do generate a lot of energy savings it can be indirect. So an energy management program might be like more of an enabling program that is gonna be leading businesses to participate in other energy energy efficiency programs and undertake capital improvements. But those energy savings are going, they could be being attributed to the, those other programs and not the energy management program.

A lot of programs are also like one to two years in length, and after that the incentives may just dry up. And so engagement between the utility and the industry post the participation in the program may be limited.

Now, that's not universally true, but in some cases it can be the case. And there's also a lot of challenges associated with the way utility systems work in Canada, and that's like fuel silo challenges. In several provinces there's an electricity utility and a natural gas utility. Maybe one or both offer energy management programs.

Maybe they collaborate, maybe they don't, but exactly how they work and how they divvy up and attribute savings and what savings they focus on, it's complex. A second broad set of challenges is resources. Now to be clear, there are resources available to support energy management in Canada, and in some provinces they're relatively substantial, and like I said earlier, the federal government just increased funding for their energy management program.

Now it's called the Green Industrials Facility Manufacturing program, I believe. We estimate the boost in its budget is approximately 65 times annually what it was previously, but to date it has not been enough. So there's currently, like I mentioned earlier, some disparity across the country in terms of energy management support programs.

Studies show that industry generally lacks the capacity to do energy management, and this is true of largest, the largest companies, but also true of small and medium enterprises, where, which is an additional whole different set of challenges in terms of supporting energy management practices.

Human resources in another area where resources might not be sufficient. Overall, we need more energy managers. And those energy managers might require additional training or tools to, to deal with like novel situations like covid or to really address like fuel switching priorities if the rules are indeed in place to target that.

So things are starting to improve here, but nonetheless, issues remain with resource disparity with the continuity of those resources and also like the general capacity in organizations to do energy management. Finally, there's this overarching issue of legitimacy. I'm gonna try to move a little bit quickly because I'm running short on time.

But in the world of, this is true of energy management, the way we see it, but also in E S G reporting, there's this like tension between is this actually real? Is it actually having an impact? And the way that you might there's different ways to address that.

One way is to put in really rigorous standards and really lock down the process, but that can have some unintended consequences or some necessary or some unfortunate kind of side effects. Too rigorous a system could really drive people away from it. On the flip side, if you have a kind of flexible system that is gonna heighten the concerns of maybe the, reported impacts or the reported practices or whatever are not really serious or they're not really real. So this is a broad issue that is affecting this. There aren't any real easy answers here but we know that anyhow, as something that kind of broadly affects energy management as a policy.

Okay. Finally, what can we do to improve our policy systems to really work toward continuous improvement?

Okay. So as I noted earlier, the core concept behind management systems of which energy management systems is one type is to work toward continuous improvement through that plan-do-check-act process. So if we want industry to follow that process, the policy system should follow it as. But what would that look like?

So first, a policy system for continuous improvement. It would aim to build on this collaborative aspects of energy management. Really recognize that energy management is too important a thing to be the responsibility of industry alone. So accordingly, like at each of these Plan Do Check Act stages there would be lots of involvement with all the relevant stakeholders in including government and utilities, industry and industry associations, but also maybe financial organizations as well.

The system could be oriented around this idea of experimental governments, which seeks to promote learning and knowledge sharing and iterative improvement. And not really this like more limited kind of public project engagement around a single thing.

So the latest the federal government's new program, the gif. Gets toward that objective, but it still really lacks an overarching context for orienting plans and actions and reporting. So to achieve that, we'd really, I think what we need to do is create or build on existing industrial sub-sector networks.

So one for cement manufacturing, one for steel, and And the task of those networks could be to establish clear and consensus-based pathways for long-term improvement in energy and G H leading ultimately to NetZero by 2050. This is really critical to the plan stage. So it would also involve identifying opportunities, but also importantly the metrics by which that progress would be tracked.

Okay. A next step would be to strengthen requirements around energy management reporting. This could entail going beyond a strictly voluntary approach, which is the way it's done now, to encourage actor involvement, the system could rely on penalty defaults, which is to say, if you want to apply for funding in some other federal government program, like the NetZero funds you would have to demonstrate that you have energy management systems in place. To reduce this The burden on industry efforts should really be taken to consolidate and act upon the various different sustainability reporting things that are happening.

There's lots of different platforms and standards and this can also frustrate the legitimacy of them as well. So like working to consolidate these into a kind of single accepted set would work would help reduce the burden. And then aligning them in supporting industry to produce the required indicators could also help balance additional requirements around energy management and auditing and prepare industry for, attracting E s G investments.

Okay. Finally, integral to the notion of continuous improvement is that things are improving. So a policy system that supports continuous improvement needs to I identify and produce performance indicators that are accepted by the broader community of stakeholders that are interested in them but they also need to be accessible to them. Transparency can be really tricky in this area, given concerns, legitimate concerns about competitiveness and confidentiality. So ultimately, a policy system for continuous improvement, it'll be really important to strike the appropriate balance on this issue, recognizing the needs of different groups.

As we said earlier, trends in climate and ESG reporting may eventually require greater transparency. So it's important to consider how to invo orient our energy management efforts in that direction. Finally, there's much that could be done to leverage existing utility program systems to bolster energy management in the pursuit of decarbonization. Governments can help fund initiatives through demand side management that currently fall outside of traditional rules such as, supporting pilots and demonstration projects. Alternatively, changing rules to incorporate fuel neutral goals, savings goals, and G H G objectives or taking a, more of a pay for performance approach to demand side management that provides compensation based on like the actual measured energy savings.

There's lots that can be done. Ultimately the relationship between utilities and industry is probably the most valuable aspect of current energy management initiatives and increased government involvement should really aim to build that out further and not replace or overlap it.

**Allison Mostowich:** I'm curious about where you see some of these different recommendations sitting, do we have the bodies right now to, potentially support these networks? Just curious about your thoughts on that.

**James Gaede:** Yes and no. CIPEC, so just for people that aren't familiar with it let me make sure I get the acronym it's the Canadian Industrial Partnership, it's a federal government collaborative initiative with Canadian industry and industry associations around energy efficiency, and it's a long-standing organization and it does great work. It is, it doesn't necessarily meet the kind of level of national high decision making level networks for industrial sub-sectors in the way that we've framed it here.

Some of the things we heard about CIPEC throughout the research is it's a great resource. They produce lots of great information. It is highly technical information, and in being so technical it might not garner the attention of, The the highest level of decision making within industry.

And it doesn't really have a mandate to do the kind of big scoping planning things that we're talking about here. In the paper we talk about CIPEC a little bit. Like it's a great example of something that could be built on to get toward a more comprehensive policy system for energy efficiency or energy management.

**Allison Mostowich:** Jesse has a question about jurisdictions that we would consider as leaders in industrial energy management either inside or outside of Canada. And if you have any comments on how they're approaching it, did that come up in the research?

**James Gaede:** I'm not quite as familiar with the status of energy management systems per se outside of Canada. I did mention earlier in the research that in other countries internationally speaking, there's a lot more emphasis on ISO 50,001 certification, which is good. But it also is, one of the things that we heard in the research is it's not a, it's not an end goal in and of itself.

Certification is not necessarily the goal. It can be useful but ultimately it is, it's not the focus. And in fact, because of the way the policy systems worked, one could raise questions about the extent to which there is a really deep corporate cultural commitment to energy management.

Because there could have been some box checking. Now I'm not saying that's the case. I'm not that familiar with the empirical analysis of it. But anyhow, it is something that we heard a little bit throughout the research that we did. Here in Canada, there's almost all provinces have had or do currently have a suite of energy management related efficiency programs.

If you wanna learn more about that, I would encourage you to go and look at our most recent energy efficiency policy scorecard, which is available at scorecard.efficiencycanada.org. Yeah, a couple provinces have maybe been in the game a little bit longer than others. British Columbia has had energy management programs of some flavor in place since I think the mid 2000s and was one of the kind of first provinces to get going on strategic energy management as a core focus.

And as I understand it now is approaching energy, strategic energy management as a cornerstone of BC hydro's broader electrification and decarbonization initiatives. On the other side of the country, efficiency nova Scotia has also had strategic energy management program in place for some time.

In Ontario, Enbridge has a strategic energy management program. The ISO has had a longstanding energy manager program, which supports the hiring of an energy manager in a company, but they are actually transitioning that to a strategic energy management program. And then yeah, also out on the east coast again New Brunswick Power, I think is piloting a strategic energy management program.

So we're seeing a lot of action. Some provinces have been in the game for a little bit longer than. But overall, I think the trends are in the right direction. I hope that was like political enough to not upset anybody.

**Allison Mostowich:** Always our goal. Okay, so Pam's got a question about the greatest GHG reduction opportunities in industrial facilities that could be highlighted through energy management.

So whether it's like envelope, mechanical waste, heat did that come up in the research at all?

**James Gaede:** Yeah, so this is, we didn't really get to that level of of opportunities within a certain facility. In my understanding is it's very highly dependent on what kind of industry it is, what the facility's like, where it operates. So I really, yeah, I am not well placed to answer that question. I think from what I've heard and what we've read and throughout the research, energy management is the kind of one thing that is just generally applicable across all these industrial sub-sectors.

The types of energy reductions that it might be achieving and different sub-sectors could ver definitely vary. In one area that's broadly applicable is just like those operational and behavioral changes as well in an organization.

**Allison Mostowich:** Okay, so John's wondering about the government's doing anything in their own facilities, like public facilities and if there's any sort of coordination that you've seen across governments in Canada.

**James Gaede:** It's a great question actually, and it's one area that I am really not all that familiar with. My colleague Abhi is much more familiar with energy management in these kind of, in the much sector, I guess broadly speaking. I. I might have to get his thoughts on that and and maybe bounce the ID off him.

I'm not, I un unfortunately am not that familiar with this area.

**Allison Mostowich:** I'm curious about a couple things. So lots of things really. The carbon tax. So what do you see as a big driver for energy management systems? I know you've talked about government funding, but are there like larger contextual pieces that you see driving more people to go towards energy management systems?

**James Gaede:** Yes. I would say that based on the research that we did, the studies seem to show that industry is motivated to pursue energy management, not necessarily for the cost savings or the energy efficiency savings, per se. Could be more general, like having some kind of sustainability impact. The most commonly cited benefit after having put one in place is those cost savings that come from the energy efficiency improvements.

I don't know if that really gets to your answer. From what we hear, A lot of organizations that are participating in energy management programs are increasingly focused on GHGs. That's the main thing. It's a bit challenging to adapt energy management programs as they exist presently for some of the reasons that I mentioned earlier, to really serve that decarbonization objective.

There's a, like I mentioned, some of the things that, some of the changes that could be put in place or some Modifications or adaptations or whatever in utility demand side management systems around fuel neutral goals that might help you know, that we also need some tool, like the tools.

It really focusing on decarbonization within energy management is challenging. It can be done, but it's it can be challenging translating energy, intensity savings. Into G H G savings is challenging from many different evaluation and E M N V reasons that I'm not particularly well placed to talk to.

But that's what I've heard. Yeah, I think, moving forward. And another thing that we heard again is a lot of the potential connections and, just serendipitous alignment between the rise of E S G investment which is troubled in many ways, but and, industry wanting to attract that investment.

And, demonstrating real G H G reductions and energy savings is one way that they can do that. If the right systems and rules are put in.

**Allison Mostowich:** Interesting. Thank you. Okay, so financing. What makes energy management systems viable? Is there financing available through NRCan? So David Katz was asking about there was a $40,000 incentive, what's available right now?

**James Gaede:** Yeah. This is too big to say in one answer. So there's two main sources for in incentives, financial incentives for energy management.

And that is, in some provinces, provincial utility energy management programs of some variety. And then there is also, and, but like I should just say on that, the exact nature of those programs varies. The provinces that do have them They're moving all more toward the strategic energy management approach.

Within that, there's a broad array of things. There's, does it provide support for energy managers or like a regional energy management consultant and all sorts of different variables. That's one source of resource support. Now the other one is the federal government at the moment.

So previously I would, I mentioned earlier the federal government had an ISO 50,001 support program. It wasn't only for ISO 50,001, but that was one of its main kind of components. That was the program that provided up to 40,000 I think per facility to pursue an ISO 50,001 certification.

That program has been completely overhauled now and is now this new program, the Green Industrial Facilities Manufacturing Program which is taking a different tact.

So in that program there's two tracks. Track one is the one that's out now. Track two is closer to the older one and will come out in the summer. Track one is the new one. And it is a much bigger pot of money. It offers up to $20 million to project proponents to actually deliver energy management program. And a number of other things, training, initiatives and so forth. , there's yeah, those are the two main source of financial incentives for energy management systems.