Carbon Accounting and Sustainable Designs in Product Lifecycle Management

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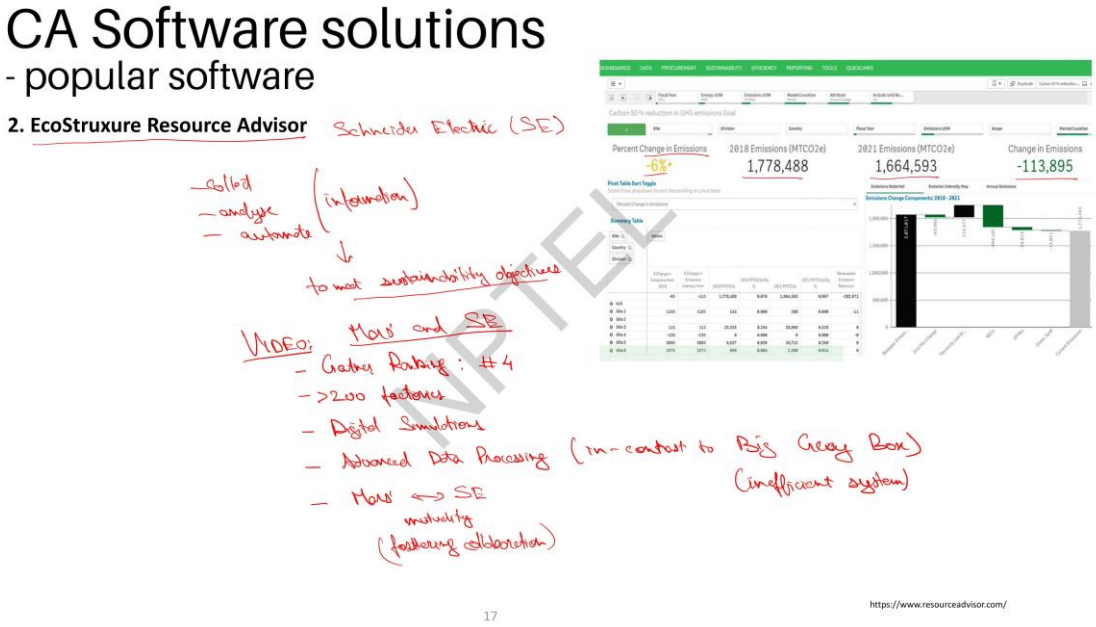
Week 07

Lecture 33

Carbon accounting software (Part-2)

Welcome to the second part of the lecture on carbon software solutions. We are in the course Carbon Accounting and Sustainable Designs in Product Lifecycle Management. We are discussing about the carbon accounting software solutions. In the last lecture, I talked about certain key characteristics of a good software solution that helps you to gather the data and provide the solutions as per your requirements. I talked about a few big software solutions which are available in the market.



And we were talking about the EcoStruxure Resource Advisor in the last. And I showed you a video in which you looked at the partnership between Marsh and Schender where EcoStruxure, that is SE's integrated suite of digital solutions, which is designed to improve efficiency, sustainability and performance.

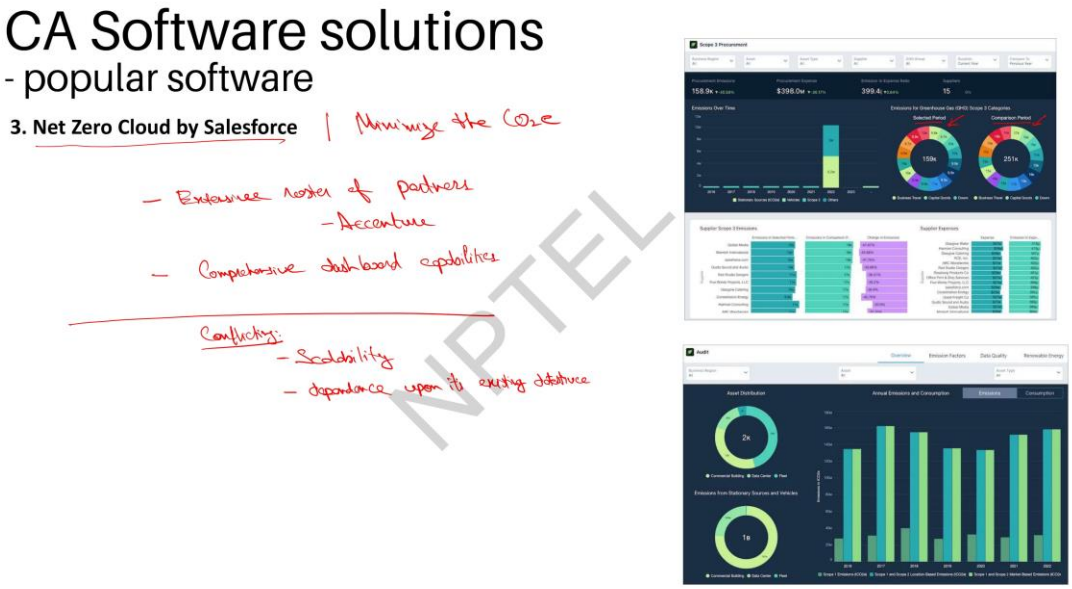
I also mentioned in the video that Gartner ranking is number four in supply chain management in the past two years from the time of the video when this video was developed. And as I talked about the key characteristics here, the industrial collaboration, sustainability market experience, unified auditing, reporting the emission data, customization and individualized existence.

That is why I wanted you to see this video in which they have given these pointers here. That is, Shander already has operated in over 200 factories, that is more than 200 factories which showcases a large experience or wide experience that they have. So in their own digital solutions in their own factories they have employed these systems and proof of technology that they give is through digital simulations.

I'm talking about the video that you watched about Marsh and Shander Electric collaboration. So they say that there was a big gray box when they come to Marsh and Shander emphasized on hardware aiming to enhance efficiency and sustainability through advanced data processing.

So, this came exactly in contrast to what they had before that is a big grey box. Big grey box that is an inefficient system. This collaboration between Marsh and Chandra Electric is also one of the examples. That could be quoted as how important it is to collaborate with a good or great software solution provider in carbon accounting. EcoStruxure Resource Advisor was able to manage the data, was able to put the data into a structured form.

Was able to organize the data and analytics helped them to also have the future forecast of how energy is being managed and how the throughput should also be there. But whatever the Mars targeted upon, that is Mars principles of mutuality they talked about. So both Mars and SE had mutuality, that is collaboration. I will put mutuality, fostering, collaboration. So, this turned up to be a beneficial relationship with both the partners.

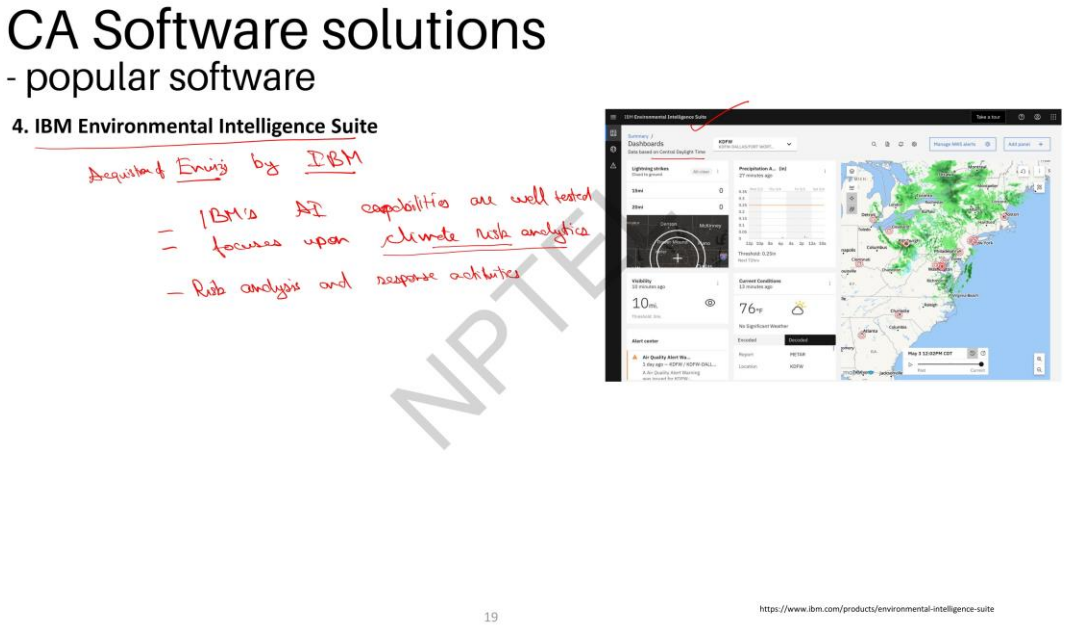


Next, what was solution that I have? In my list is Net Zero Cloud by Salesforce. Net Zero Cloud highlights the enduring dedication of Salesforce. This is an emission accounting software that is developed by Salesforce's automation, that is language support and integration capability that Salesforce has. So this software also has very interactive dashboard where emissions from the different sources could be seen in different colors.

So we select the period, we compare it with the period that the past and the present emissions could be shown. And also we can have the distribution of the asset, whatever there is in the company and what are the emissions coming from them. A lot of things could be calculated. So net zero, the target obviously is to minimize emissions. The carbon dioxide emissions.

So, this includes an extensive roster of partners which include Accenture as well on their board. So it has comprehensive dashboard capabilities. But there is still something contrasting or something that is conflicting here is that is scalability. When I try to see the user feedback of net zero, they say the general scalability is still questionable here and dependence upon its existing data structure. Though this is in wide use nowadays as well and people are using its existing data structure.

However this criteria that i mentioned about customization individualized assistance. That is lacking to some extent in the net zero cloud by Salesforce.



Next comes IBM Environmental Intelligence Institute. IBM is a big name in computers. So acquisition of NVG by IBM led to development of this intelligence suite.

It primarily consists of a legacy software designed for management of large amounts of data that is IBM's AI capabilities are well tested. So this helps to manage the emissions and majorly focuses upon the climate risk analysis. I will put it. So, it majorly focuses upon the climate risk analytics. So, you can see this JASPOT is showing that data based upon the central daylight time, it is showing that there are certain target pointers where there could be visibility problems.

So, majorly this is focusing upon the climate risk analytics. That is, if I talk about the scope 1, scope 2, scope 3 emissions. Talking about scope 2 only majorly because these are activities outside of your industry. I will talk about scope 1 emissions, scope 2 emissions, scope 3 emissions in this lecture itself. So this is IBM whose significant portion of the portfolio, this product portfolio is dedicated to risk analysis and response activities.

So this is designed to operationalize carbon accounting. Its capabilities enable organizations to track disruptive climate circumstances. That is climate risk analytics is taken care by IBM Environmental Intelligence Institute. Next comes Sfera. Sfera is a software solution or a subsidiary of the Blackstone Group.

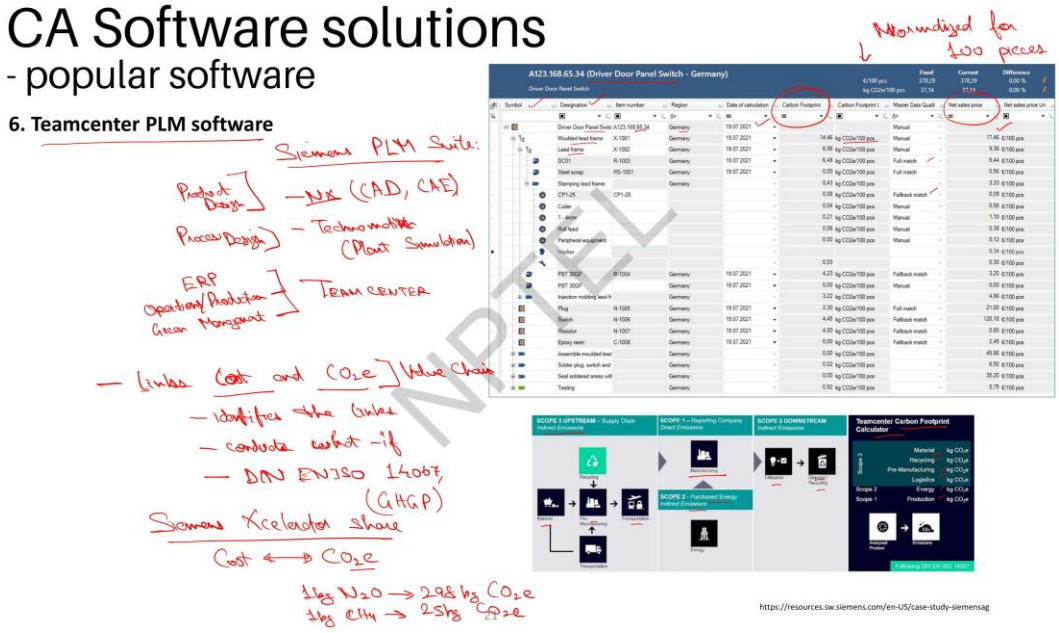
So Sphera is also a comprehensive software for ESG performance and risk management. It has also a integrated perspective on emissions control. So priority here is given on safety and liability reduction. That is, the number of incidents that happens in a factory, the accidents which are there, the illness that is there, because of that. Whatever the cost is incurred or whatever emissions happen because of that, the activities which are there or the tasks which are taken to mitigate that.

That has to be minimized. This is taken care by Sfera. For instance, it is reporting here the incident frequency rate is 6.89 and there are certain on-time completion of the activities is 76%. So, overdue actions are 19. Overdue actions from learning is 137 and so.

So, it works upon the safety and protection of the manpower, of the machinery, whatever is there in our organization. It enhances safety. Organizational safety so in order to establish trust or to favor the environmental image it helps in this direction so by consolidating reporting and managing the data. SFERA aims to eradicate the information

silos for teams engaged in safety and sustainability initiatives. Eradicate the information silos.

So, this is for teams who are engaged in safety and sustainability. I have picked software solutions which work in different domains like IBM is working in the climate risk as well. The Sfera is working in the safety and the sustainability domain. There are software solutions which work majorly within the factory. It is scope one emissions itself.



Team centers is also one of the software solutions that work in the scope one. Team center PLM software, this is the last software solution that I am going to present in this lecture. This is developed by Siemens PLM Suite, which has NX in it. NX is a computer-aided design software. It is not only CAD, it also helps you to simulate what you develop.

It is also a computer-aided engineering software. Then we have technometrics. Like I talked about the product design in the previous lecture. This is taken care by NX. Then comes the process design.

This is taken care by technometrics, which is a plant simulation software. Plant simulation means where to place the machines. How would the material transfer from one machine to another, what would be the material handling system or so. Then comes your ERP system development. ERP system or you call it operations management, even production management.

Nowadays, we also call it the green management. This is taken care by our team center. So, it link cost that is the cost that is being incurred and the carbon dioxide emissions. So that is, it develops that in a value chain. For the cost you see upstream that indirect emissions are there recycling material pre-manufacturing transportation, that is going on.

And in the manufacturing concern, we have only manufacturing in which purchase energy that is coming from the scope 2 and scope 3. Is again downstream, here where utilization disposal everything is there.

And team center carbon footprint calculator is giving you the material, recycling, pre-infection, logistic, energy, what is the carbon footprint output that is coming out. So this is one of the reports that is generated by a team center, PLM software for driver door panel. Switch of a car in which you can see it is giving the symbols the way it was designed.

These are all designed in the NX module only. The symbols are given there. Then technometrics gives you the location of the machine the way it is developed the way it is manufactured. So, designation or the name of the component, that is driver draw panel, module, lead frame, so on. And item number, whatever the number is assigned to that, region from where it is working.

This is one of the examples taken from Germany, the manufacturing is in Germany itself. The date of calculation, 2021 year calculation is there. Carbon footprint, for a specific, for example, moulded lead frame, 14.46 kilogram of carbon dioxide emission per 100 pieces it is given. So this is all data that is normalized for 100 pieces. So how was this taken?

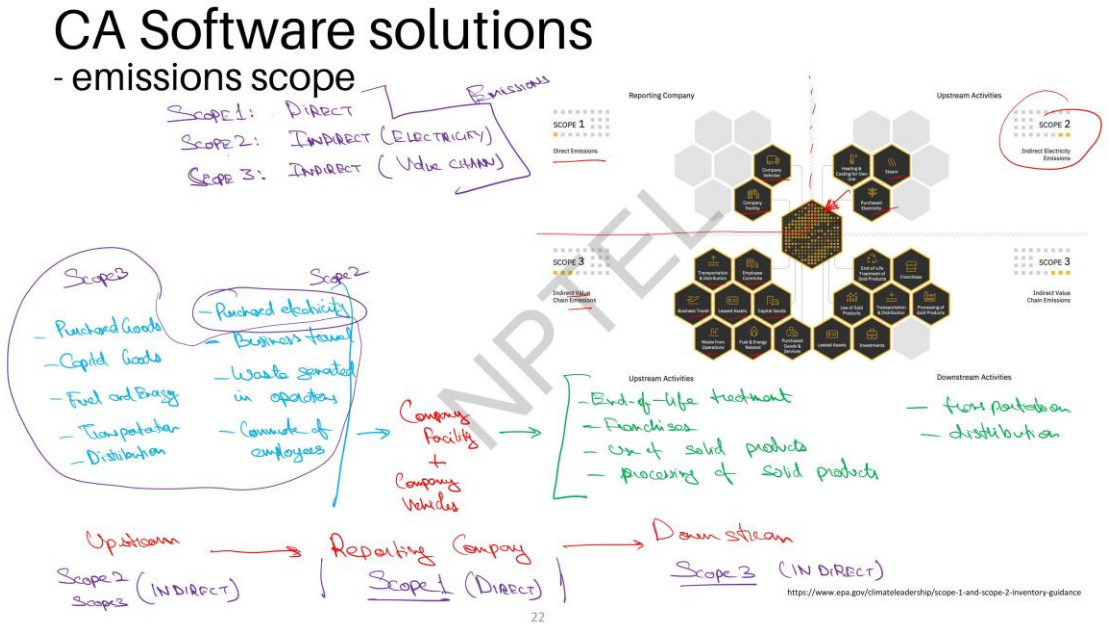
Manual, full match, fallback match and so a net sales price. What is the sales price of this per 100 pieces? So it is connecting carbon footprint and your sales price. So, that links cost and carbon dioxide emission. So, this identify the cost and carbon dioxide emission drivers and dependencies.

It uses benchmark data for cost and carbon dioxide emissions to perform what if simulations. So, that means it identifies the links and it conducts. What if analysis? So, there is something known as generative CAD. For example, if you need to design something, for example, if you need to design this charger, what is the maximum strength of the pin that is here?

What should be the strength here? What should be the thickness here? We can keep on changing thickness and try to see what is the material input, what is the carbon emission linked to it. You will see this in a video, there is a very short video, in 2-3 minutes video and we will see how does it conduct. What if analysis and cost is also linked with it.

So, we get accurate results using integrated carbon taxis as well here. The calculations which team center makes is based upon the international standard. As I talked about many international standards, it is linked to the DINENISO 14067. This is from the GHGP, GHG protocol that I talked about in the last lecture. So, also there is a platform in theme center itself that is Siemens accelerator share.

So, this share cost and carbon dioxide emission and try to break down as per our requirement. So, when I say carbon dioxide emission, it is e, e is equivalent CO2e. That is, I am still stressing again, it is not only carbon dioxide, it is equivalent of carbon dioxide. For example, 1 kg CO2 of nitrous oxide is equal to 298 kg of carbon dioxide equivalent or 1 kg of methane equals 25 kg of carbon dioxide equivalent.



So, last I will just focus upon the scopes that I talked about throughout the lecture. One is about direct emissions, that is, company vehicles, company facilities, whatever it is. That is, the reporting company, whosoever is reporting this, whatever comes in their

prerogative is scope one. That is the manufacturing concern. For example, I have a manufacturing concern here. I will put it here in a straight way.

This is a reporting company. And we have upstream and downstream activities. Upstream is what is coming as an input to the company. Upstream, this is downstream. Upstream activities, whatever is coming to the company that is heating and cooling system, steam, purchase electricity.

That is coming as an input to the company that comes in scope 2. Scope 3 is our indirect value chain emissions. For example, transportation and distribution, employee commute, business travel or capital goods, leased assets. Waste from operations, fuel and energy and so. This is all scope three.

End of life is also scope three. I can put it in there. I can put it in this way from upstream. It goes to reporting company. It comes to downstream activities and here whatever we have only our own company facility or vehicles of the company.

That is I would put it as company vehicles. Here upstream, all the other activities. Like it is mentioned here, the purchased goods capital goods, fuel and energy related activities transportation and distribution in the upstream. Along with it, we have for example, purchase electricity. Then any business travel, I would also put the waste that is generated here.

Waste generated in operations. Then commuting of the employee, I have put the points here. So on. This is my upstream activities. Getting into the company and from the company, it goes downstream.

Again, the transportation and distribution that is downstream processing of the solid products or I would start it from end of life treatment. Then we have franchises. We have use of solid products. We have processing of solid products. Transportation downstream along with transportation distribution.

That is their downstream or any other activity that comes downstream is in our scope 3. I will now put scopes here this is reporting company that is my Scope 1 that is direct. Then comes scope 3 here. Scope 3 that is indirect. Here it could be both scope 2 and 3.

Majorly it is scope 2 and also it could be scope 3. But both of them are indirect. So, what is scope 2? Scope 2 is purchased electricity. This is scope 2.

And all the other activities that I have mentioned here, comes under scope 3. I hope it is very clear now, I will still jot it down here. Scope 1 talks about the direct emissions, scope 2 talks about the indirect emissions which are from electricity. And scope 3 talks about the indirect emissions which are through the indirect value chain. We are all talking about emissions here.

So, with this I am closing my lecture on carbon accounting software solutions and also I am closing my week 7.

Thank you.