ENERGY CLUB
IIT BOMBAY

itc Institute Technical Council

THE CARBON CODE: TRADING, TRACKING AND TRANSFORMING EMISSIONS

DAY 4

CARBON MARKETS AND THEIR ROLES EXPLAINED

Carbon markets are essential tools in climate policy. They provide a flexible, cost-effective way to reduce emissions. Carbon markets exist under both mandatory (compliance) schemes and voluntary programmes. They are significantly different to each other in terms of regulations, impact and market size, among other factors.

- Tradeable Credits
  Carbon markets allow trading of emission allowances.
- Incentivize Reduction
  They create financial incentives for emission cuts.
- Price Carbon
  Markets establish a price for carbon emissions.

COMPLAINCE CARBON MARKET(CCM)

Compliance markets are created in response to legally binding emissions reduction targets set by regional, national and international agreements, such as the 1997 Kyoto Protocol and the 2015 Paris Agreement. Compliance markets usually function as cap and trade schemes, known as ETSs – Emission Trading Systems. They are regulated by national, regional, or international carbon reduction regimes and are currently valued at around €230 billion worldwide. Buying carbon allowances on the compliance market is a way for entities under the scheme to exceed their own carbon budget. Conversely, an entity that is emitting below its own target might sell surplus allowances to raise money for the treasury.

Compliance markets can allow the use of carbon offsets from the VCM, with limited application - in 2020, the EU ETS has phased out the option to use international credits from CDM and JI towards fulfilling part of the set obligations under the scheme. The Paris Agreement outlined provisions on the use of markets to provide a clear framework for linking carbon markets in the future.

click here for an informative video

VOLUNTARY CARBON MARKET(VCM)

- Voluntary carbon markets (VCMs) exist alongside compliance markets and enable companies, non-profit organizations and individuals to purchase carbon credits on a voluntary basis with no intended use for compliance purposes.
- Buying credits on a VCM doesn’t directly help a country meet its obligations under the Paris Agreement, but it helps companies to **offset their individual carbon footprint** and thus overall net emissions.
- The size of VCMs has quadrupled since 2020, yet they are still relatively small, with approximately €1.5 billion worth of carbon offsets traded in 2021.

click here for an informative video

CARBON ACCOUNTING

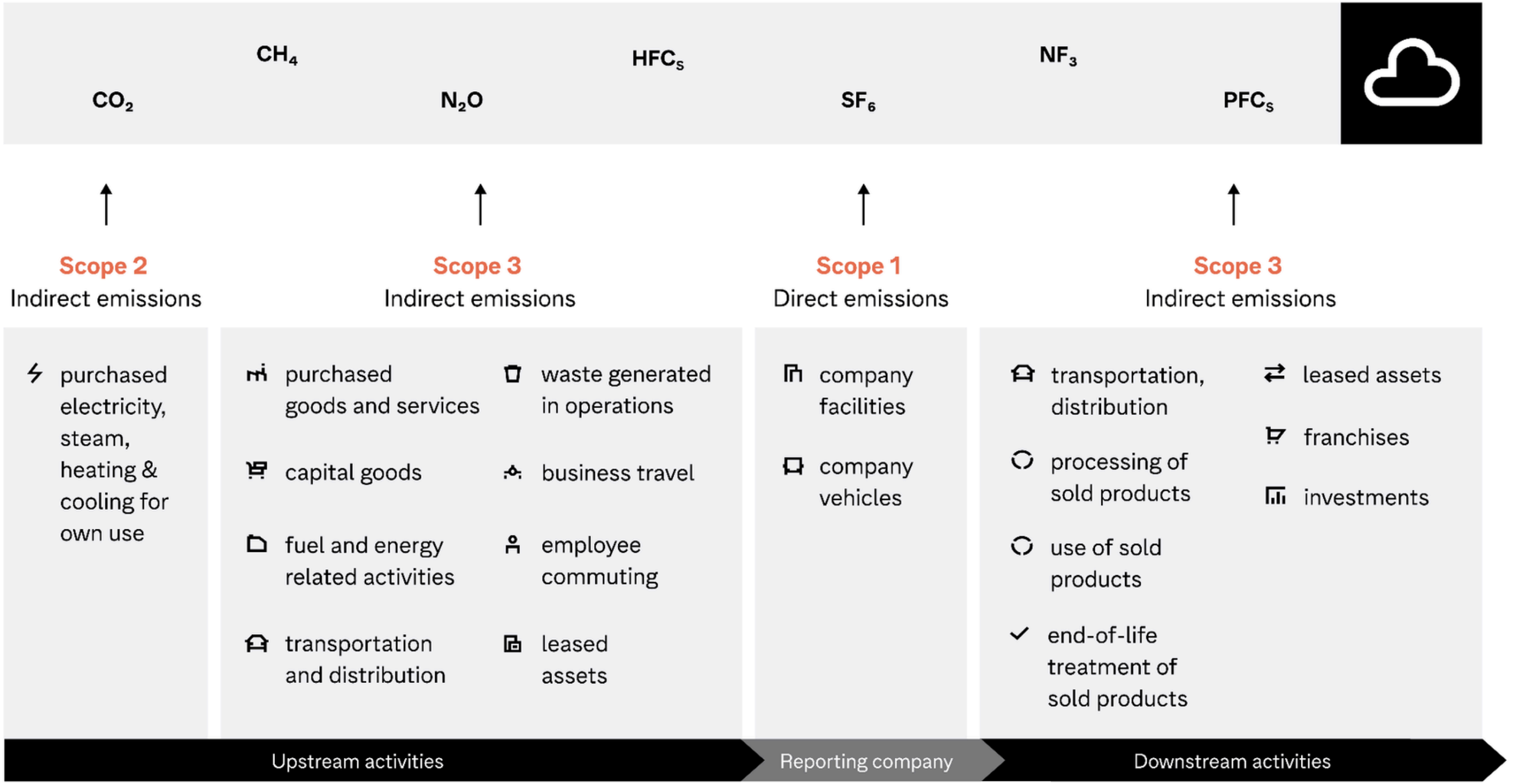
- Carbon accounting is a way of calculating how much greenhouse gas an organization emits. Like financial accounting, carbon accounting quantifies the impact of an organization's business activities – though instead of financial impact, it tracks climate impact.
- Also known as **"greenhouse gas accounting,"** carbon accounting is used to estimate carbon footprints for businesses, governments, and even individuals. The foundations of carbon accounting can be traced back to Renaissance Italy – though carbon accounting as we know it today began in the early 2000's.
- Carbon accounting helps organizations understand their carbon emissions so they can identify hotspots, enabling them to begin their reduction efforts with high-impact actions.
- And even when an organization has reduced its carbon as much as possible, calculating its carbon footprint will still help it estimate its residual emissions. The organization can then use climate investment to compensate its remaining emissions, completing its journey to net zero. Along the way, organizations will want to share their progress with stakeholders like customers, investors, and employees – or they may even be required to report their emissions by law. Carbon accounting enables companies to report their climate impact.

CARBON ACCOUNTING

What is required for carbon accounting?

Carbon accounting requires two things: data collection and data processing.

Carbon accounting relies on two sets of data: business data and emissions factors. Business data describes the activities performed by a business. This can be either:
Spend data – how much money was paid to company X for a certain good or service, or
Activity data – how many liters of fuel or kilograms of material were bought.
The infographic below shows the business data required to calculate a business's full carbon emissions, including upstream and downstream sources:



Emissions factors are the second type data required for carbon accounting. They specify the amount of greenhouse gas emissions associated with a given unit of business data.
Once all the needed data has been collected, it can be translated into emissions estimates.

CARBON ACCOUNTING

Carbon accounting calculates an organization’s greenhouse gas (GHG) emissions using two methodologies: spend-based and activity-based. The hybrid methodology combines spend-based and activity-based methods.

The spend-based method of calculating GHG emissions takes the financial value of a purchased good or service and multiplies it by an emission factor – the amount of emissions produced per financial unit – resulting in an estimate of the emissions produced.
Spend-based emission factors are typically derived from so-called environmentally extended input-output (EEIO) models that depict the flow of resources between different sectors of the economy. Based on this, one can calculate the average amount of emissions associated with each unit of money paid to a company in some specific industry and region.
Since spend-based methods’ emission factors are built on the industry average greenhouse gas emissions levels, spend-based calculations can lack specificity.

The activity-based method uses data to specify how many units of a particular product or material that a company has purchased. For example, it could be liters of fuel, kilograms of textile, etc.
Like the spend-based method, the activity-based method also uses emissions factors to determine an activity’s emissions output. These emission factors are often taken from scientific studies.

In carbon accounting, activity data generally allows for more accurate emissions estimates than spend-based data. Thus, the hybrid model methodology is recommended by the Greenhouse Gas Protocol, the most widely-used carbon calculation standard.

CARBON ACCOUNTING IN SHORT

Data collection & processing

Supply chain activities

Spend data
How much a company has spent on a purchased good or service

Activity data
Amount & unit of a particular product or material that a company has purchased/consum

Conversion factors
Converting data into a common unit of measurement

Supply chain activities

Supplier-specific data
Supplier emissions or product-level emission

Calculation

Emissions factors
Translating a business activity into its associated GHG emissions

Results

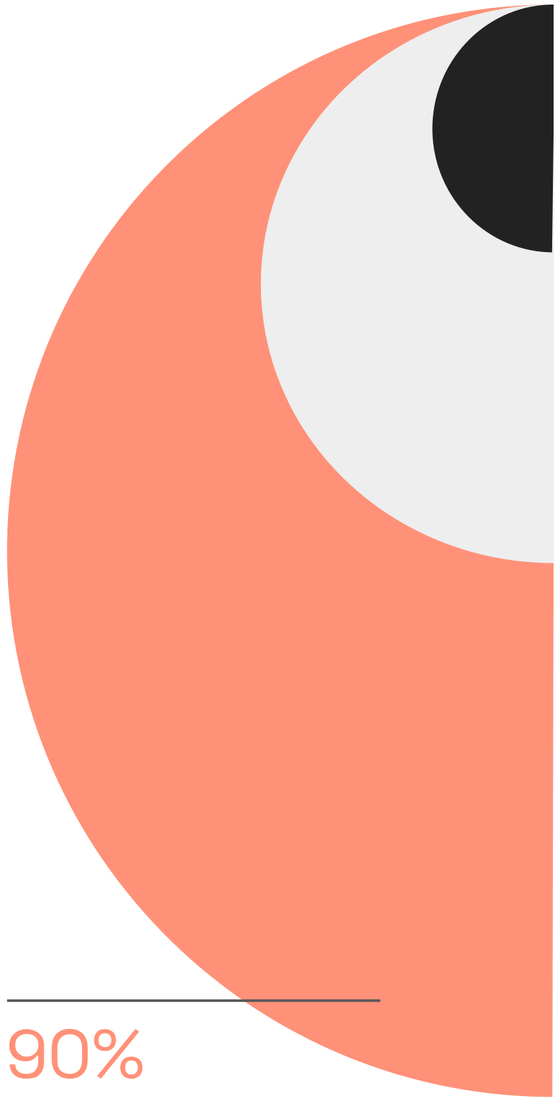
Emissions calculations
A complete inventory of greenhouse gas emissions resulting from an organization's business activities

Reporting & taking action

- **Target-setting**
- **Reduction initiatives**
- **Value chain engagement**
- **Regulatory & investor requirements**
- **Sustainable branding**

OUTPUT

Emissions estimates are often broken down into emissions “scopes,” based on where the emissions originated from. There are three scopes defined by the Greenhouse Gas Protocol:



90%

of emissions are typically within scope 3

Scope 1

Direct emissions resulting from vehicles, fuel use, and/or chemical leakage

Scope 2

Indirect emissions resulting from bought electricity, cooling, heat and/or steam

Scope 3

Other indirect emissions that occur in the value chain of a company and are not already included within scope 2 (such as emissions resulting from purchased goods and services, transport, or business travel)

THANK YOU