China Council for International Cooperation on Environment and Development (CCICED)

PHASE VII
BACKGROUND NOTE

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Accounting for the Enormous Potential Lost Financial Value of Fossil Fuel Physical Assets

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"It's up to you now, Miller. The only thing that can save us is an accounting breakthrough."

Image credit: Weber, R. (1991, August 26). ***The New Yorker.*** https://condenaststore.com/featured/its-up-to-you-now-robert-weber.html

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Executive Summary

This note examines the concept of climate-related stranded assets, including how current financial and management accounting standards and practices might cover some aspects of stranded assets through rules like asset deprecation and asset impairment, as well as gaps in current standards and some recent trends of relevance. This note has been prepared as a background technical paper in support of CCICED's work.

The idea of **assets stranded by climate change** was popularized by the *Unburnable Carbon* report from the Carbon Tracker Initiative in 2011. Though the report focused on fossil fuel assets, climate-stranded assets can be more generally defined as any assets that suffer unanticipated or premature write-downs, devaluations, or conversions to liabilities due to climate-change-related impacts.

The term "**stranded assets"** is not normally used by the accounting industry. The accounting industry uses the term "**impaired assets.**" Conceptually, they are similar, but one has a certain set of analytical definitive rules ("impaired") and the other is more strategic or conceptual ("stranded"). There is a wide range of accounting rules and protocols governing how and when an entity can declare an asset is impaired. At present, there is no special process for fossil fuel assets, but many accounting organizations are now looking at this situation.

Fossil fuel physical assets represent the single greatest financially valued category ever created or discovered by humans. Although it is believed humans started consuming coal for heat in China (3,600 years ago) and by the Romans in England (around 2,000 years ago), the large-scale consumption of fossil fuels only began with the creation of gas lamps for use in factories (1790s) and then the combustion engine (1860s) for the creation of energy.

It is estimated that there are potentially EUR **100s of trillions** globally tied up in hard assets related to the extraction, processing, distribution, and consumption of fossil fuels. Most of these hard assets have useful lives of 30 to 60 years, with a great many of these assets having been built in the last decade, and many are still being built today. These assets are then **depreciated** (i.e., expensed on the balance sheet and income statement) over the asset's standard useful life (i.e., 50 to 60 years for a coal or natural gas power generating plant).

The financial dilemma facing us is what will happen in 2050, the target date for net-zero under the Paris Climate Agreement, when these assets are supposed to be no longer in use? According to most accounting rules applied in most jurisdictions covering the normal deprecation and impairment of assets, a large proportion of these assets will have only used up 50% of their value during this lifetime. It is, therefore, possible that as many countries approach their carbon neutrality targets in 2050 and 2060, the remaining 50% of assets would have to be written off in a short period of time based on impaired asset rules. When this time comes, the value of potentially stranded assets directly linked to humans no longer burning hydrocarbons could easily be in the 10s or possibly 100s of trillions of Euros. If done suddenly, such a write-off of these assets would likely result in multiple financial and real economy shocks, since the write-offs could result in numerous consumer, corporate (industrial and financial), and governmental bankruptcies in which fossil fuel-derived profits, dividends, royalties, and tax revenues drop to near zero. To deal with this situation, it is critical that actions be taken now and in the immediate future to allow and/or require corporations and governments to more critically evaluate their fossil fuel hard assets as possibly becoming stranded (e.g., impaired).

Current Activity (Most 2023 and 2024)

Presently, a range of accounting professional groups and governmental entities are taking a series of actions that will involve the greatest disclosure of required financial related climate and sustainability information in corporate annual and quarterly reports than have ever been done before 2024.

- The International Sustainability Standards Board (ISSB) was launched by the International Financial Reporting Standards [IFRS] Foundation at COP 26 (1991) with the aim of improving the consistency

and quality of sustainability reporting across the globe, by matching the importance of sustainability reporting with the current regulations around financial reporting.

- The European Union's (EU's) Corporate Sustainability Reporting Directive (CSRD) came into effect. It requires that a range of sustainability topics be covered in a dedicated section of a corporation's annual management and financial reports.
- With the CSRD now in effect, the principle of *double materiality* is now being put to its first official test. The CSRD establishes that sustainability reporting shall be based on the principle of double materiality (referred to in this document as "materiality").
- Implementation of IFRS S1 and S2 by the ISSB: Its first two International Sustainability Disclosure Standards: (1) IFRS S1: General Requirements for Disclosure of Sustainability-related Financial Information and (2) IFRS S2: Climate-related Disclosures.
- The World Bank noted in *Sovereign Climate and Nature Reporting: Proposal for a Risks and Opportunities Disclosure Framework* in January of 2022 that 40% of the USD 100 trillion global bond market was issued by governments. With this as a background, the World Bank and International Public Sector Accounting Standards Board (IPSASB) established a working group in 2023 that will create the first Global Public Sector Reporting Standard. The goal is to publish a draft for public comment in the late 4th quarter of 2024.
- The Dutch government in 2019 banned the burning of coal to generate electricity effective 2030. Based on public information, this policy has resulted in at least three Netherlands coal-burning power plants to declare the plants impaired: combined, they have taken several billion Euros in write-offs (Appendix B).

Going Forward

Going forward, we recommend a series of actions be pursued by a range of entities:

- **government policy:** National government policies need to be established in regard to specific activities with clear effective days for when the stated activities will no longer be allowed.
- **make disclosure and transparency the new norm**: Major economies, including China, should examine ways to harmonize their emerging accounting rules with the EU's CSDR.
- **public sector accounting:** The World Bank's joint effort with ISPASB on public sector accounting guidelines related to climate change should be expanded to include senior representatives from leading global economies.
- **special treatment for fossil fuel assets**: IFRS should explore the establishment of a specific working group focused on balance sheet revisions unique to fossil fuel-related assets. The accounting profession (led by IFRS) should explore the possibility of establishing special guidelines and principles for depreciation and how an impaired fossil fuel hard asset is defined.

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I. Introduction, Background, and Terminology

The purpose of this paper is to examine a growing policy discussion around climate change-related stranded asset risks specifically related to fossil fuel consumption, and the current accounting rules related to how assets used to extract, process and consume fossil fuels could (and will most likely) lose part of their book value as the assets are classified as being impaired.

To achieve the above-stated purpose, this paper examines how current accounting standards and rules address the potential financial losses stemming from the early retirement (i.e., impairment) of assets directly tied to the burning of fossil fuels. To do this, a series of interviews were held with a range of experts, a review of numerous organizations' websites (Appendix A) was completed, and an extensive Internet research scan and review of relevant publications and papers was performed (Appendix C, but not meant to be exhaustive).

A. Stranded vs. Impaired Assets: Similar but different (two critical terms)

"Impaired assets" as an accounting term has existed for over 100 years. It includes guidelines and rules set by accounting standards boards at the national level that are put into effect by governmental policy, regulations, and laws. If something is officially identified as an impaired asset, it will have a direct link to a legal entity's balance sheet and income statement.

The term "stranded assets" is more of a strategic and conceptual concept, although it has become commonly used since 2011 in reference to climate change-related stranded assets.

1. impaired: An impaired asset is an asset that has a market value less than the value listed on the company's balance sheet. When an asset is deemed to be impaired, it will need to be written down on the company's balance sheet to its current market value. (*) Assets should be tested for impairment regularly to prevent overstatement on the balance sheet. (*) Assets that are most likely to become impaired include accounts receivable, as well as long-term assets, such as intangibles and fixed assets. (*) When an impaired asset's value is written down on the balance sheet, there is also a loss recorded on the income statement. (*) Generally accepted accounting principles (GAAP) and IFRS have differing standards for impairment. (ref. 78)

2. stranded: Stranded assets are "assets that have suffered from unanticipated or premature write-downs, devaluations or conversion to liabilities. Stranded assets can be caused by a variety of factors and are a phenomenon inherent in the 'creative destruction' of economic growth, transformation, and innovation; as such they pose risks to individuals and firms and may have systemic implications. Climate change is expected to cause a significant increase in stranded assets for carbon-intensive industries and investors, with a potential ripple effect throughout the world economy." (ref. 11)

B. Fossil Fuels

Fossil fuel physical assets represent the single greatest financially valued category ever created or discovered by humans. Although the subject is discussed regularly by members of society and is in the news every day, no clear definition of the term "fossil fuel physical assets" has ever been agreed to. In this paper, we define the term to include all assets in the value chain of coal, natural gas, and petroleum (extraction to burning). These assets include but are not limited to:

- raw materials in the ground,
- extraction (mines, drills, rigs, etc.),
- processing (refining, cleaning, crushing, etc.),
- distribution (pipelines, ships, trucks, tankers, rail cars, etc.), and
- consumption (power plants, transportation, cooking, heating, etc.).

Although it is believed humans started consuming coal for heat in China (3,600 years ago) and by the Romans in England (around 2,000 years ago), the large-scale consumption of fossil fuels only began with the creation of gas lamps for use in factories (1790s) and then the combustion engine (1860s) for the creation of energy. (ref 61)

C. Accounting

Current accounting and auditing practices, rules, and guidelines vary by country, with the United States being the only major country that does not follow IFRSs, which are set by the International Accounting Standards Board (IASB). Most countries (except the United States), follow guidelines established by the IFRS. These are principle-based standards and not a rule-based set of guidelines: each country sets its own rules (the biggest being GAAP in the United States).

II. The Issue: The stranding of usable and financially valuable fossil fuel physical assets

"The idea of assets stranded by climate change was popularized by the *Unburnable Carbon* report from the Carbon Tracker Initiative in 2011. Though the report focused on fossil fuel assets, climate-stranded assets can be more generally defined as any assets that suffer unanticipated or premature write-downs, devaluations, or conversions to liabilities due to climate-change-related impacts." (ref. 81)

It is estimated, based on our interviews with experts and implied in numerous publications, that there are hundreds of trillions of Euros globally tied up in hard assets related to the extraction, processing, distribution, and consumption of fossil fuels (they will not all be impaired or stranded). Since most of these actual valuations are not publicly available, the exact amount is unknown and cannot realistically be calculated by any organization at this time. These assets are on the
-- actual balance sheets of corporations and some governments, and
-- since they often don't have real balance sheets, they are only theoretically on consumers' (i.e., consumers as a rule do not have balance sheets and don't depreciate things like their houses or cars), and other governments' (many don't have real auditable financial statements) balance sheets.

As we move toward net-zero by reducing and then eliminating the burning of fossil fuels, all of these assets could become fully or partially "impaired" or "stranded" with little or no value unless they can be converted or repurposed for other uses, as many of these assets could be retooled or repurposed for other uses (i.e., natural gas pipelines converted to hydrogen transport or coal power plants to biowaste power plants). Any asset that can't be used in such a manner will result in a lower loss of value.

The term "stranded" tends to be used by non-accountants, and the term "impaired" is used by accounting professionals and other financial professionals.

The overall global target date to stop burning fossil fuels that was agreed to in the Paris Agreement (written in 2015 and signed by over 140 countries) is 2050: 26 years from now. COP 29 marked the first explicit reference to the transition away from fossil fuels.

Most of the hard assets that are involved in the extraction, processing, and consumption of fossil fuels have useful lives of 30 to 60 years and some longer than 60. A great many of these assets were built recently, and many others continue to be built and are scheduled to be built for the foreseeable future, as humanity continues to invest in building more fossil fuel infrastructure. It is believed that this activity is resulting in a net short-term increase in the total value of the fossil fuel physical assets that exist in 2024 vs prior years.

The financial dilemma is that with these assets having an approximate average useful life of 50 years, what will happen in 2050, when they are no longer supposed to be in use? According to most countries' accounting rules, a large proportion of these assets will have only used up 50% of their value, and it is possible that the remaining 50% would have to be written off.

When this time comes, the value of potentially stranded assets directly linked to humans no longer burning hydrocarbons could easily be in the 10s or 100s of trillions of Euros.

If done suddenly, such a write-off of these assets would likely result in multiple financial and real economy shocks, since the write-offs could result in numerous consumer, corporate (industrial and financial), and governmental bankruptcies in which fossil fuel-derived profits, dividends, royalties, and tax revenues drop to near zero.

III. Accounting and Why It Is Critical to Managing Financial Risk Related to Hard Assets

A. The Accounting Profession

The accounting function has been around since 300 BC based on bookkeeping scripts that were discovered in Mesopotamia, in what is now Iran. However, modern accounting, which includes a balance sheet, began in Florence, Italy in the late 15th century (ref 31)

Accounting as we know it today was first documented and codified in 1494 in Venice by Luca Pacioli in his mathematics textbook *Summa de Arithmetica, Geometria, Proportioni et Proportionalità.* Pacioli was the first to describe the system of debits and credits in journals and ledgers that is still the basis of today's accounting systems. (Ref 80). It was his system that provided the foundation for modern accounting, the existence of balance sheets, and the concept of asset depreciation (see below).

The accounting profession is traditionally a cautious and standards-based profession. By definition, audited financial statements would not revalue hard assets on the balance sheet of an organization unless a major action or event has occurred. Taking action today for mid-century carbon neutrality targets is not on the radar screens of accounting standards. The typical time-horizon is also very short regarding changing the value of a hard asset. If the event that is being assessed as the basis for revaluation of an asset is more than a few years away and is not being driven by a governmental law or policy, the norm would be to maintain the current valuation and defer to a later date the possible revaluation.

Changing accounting standards and practices is a very slow process.

Companies can adjust depreciation schedules, but most likely are not required to regarding climate change except, it appears, regarding burning coal for electricity generation in certain counties (e.g., see the Netherlands case study in this paper).

B. Depreciation (What It Is and Different Methods)

So, what is “depreciation”?

Depreciation is the decrease in the value of an asset and the method used to "write-down" or “reallocate” the cost of the physical asset (such as equipment) to another time period or over its useful life span.

The concept of depreciation involves spreading the costs of all long-term expenditures (assets with a useful life of over 1 year) that are recorded on the entities’ balance sheet, with a portion of the expense taken in each year of the asset’s useful life. A simple example is the building of a coal power plant. On average, the cost of building a 1,000 MW coal-fired power plant could be between USD 2 and USD 3 billion, and it has a useful life of 40 to 60 years. For simple math, we will use a USD 2.5 billion investment, a useful life of 50 years, and straight-line depreciation (see below). In this case, the government of a state-owned coal plant or private entity would most likely borrow funds from a bank and put the asset on its balance sheet at a value of USD 2.5 billion (the offset entry is a “loan payable”). The value of the capital investment would, under current accounting standards, depreciate by 1/50 (i.e., straight line) of the USD 2.5 billion or USD 50 million each year until 2075, when the asset would be deemed to have used up its useful life and would be fully depreciated—that is, the asset would no longer have any value remaining on the legal entities balance sheet.

The methods typically used (but not exclusively) are the following:

- Straight line (total cost divided by expected years of use and the most common),

- Declining balance (you take a % of the remaining asset each year that is greater than straight line, based on type of asset),
- Double-declining-balance (an accelerated method where you take double the straight line of the remaining value each year, thus writing the asset down more in earlier years),
- Units of production (based on units of production or use in the period), and
- Sum-of-years-digits (another accelerated method), and

There are many other methods that are used less often. (Ref 4)

The alternative methods beyond straight line must usually be approved by the national government where the corporation is domiciled.

C. Terminology Matters: Impaired vs. stranded assets

The accounting industry uses the term "impaired assets" more precisely than "stranded assets." Conceptually, they are similar, but one has a certain set of analytical definitive rules ("impaired"), and the other is more strategic or conceptual ("stranded").

Impairment has different definitions depending on whether the asset in question is owned by the public sector or a private entity, determined either by the International Public Sector Accounting Standard [IPASA]) for the former or the IFRS for the latter (outside of GAAP covering US-based private entities.) There are two impairment standards under International Public Sector Accounting Standards Board (IPSAS), one for cash-generating assets (IPSAS 26) and one for non-cash-generating assets (IPSAS 21), whilst the IFRS standard has only one impairment standard for cash-generating assets (IAS 36). They are similar but different.

The key factor for all "impairment" definitions is that the legal entity stating that the asset's value has clearly been impaired must be provable to the auditor and securities regulators based on one of three factors:

- Lack of demand for products produced by the asset that will be long term in nature (road transportation: horse carriages vs automobiles)
- The product that is being produced has been made technologically obsolete by a change in how the service is delivered (voice communication: mobile phones vs landlines)
- Government laws or policies have changed that have materially impacted the produced product's value (coolant: eliminate CFCs/freon and Montreal Protocol)

Impaired assets can go down and then up in value if another major event occurs. Upon recording the impairment, the asset has a reduced carrying value. In future periods, the asset will be reported at its lower carrying value. Any increase in value is recognized upon the sale of the asset. Under IFRS, impairment losses can be reversed in specific instances. However, in the United States, even if the impaired asset's market value returns to the original level, GAAP states that the impaired asset must remain recorded at the lower adjusted dollar amount. This is in compliance with conservative accounting principles. (ref 33)

D. Types of Accounting

1. Financial vs. Management

a. Financial Accounting

Financial accounting is what most people think of when they think of accounting. It is a highly organized and regimented profession that has very set guidelines and rules. The rules are almost always set at the national level and pertain mainly to legal entities/companies that are incorporated in that country. They set out how expenses, revenues, assets, and liabilities are recorded and reported to the shareholders of the company.

If the company is publicly traded on a securities market, all of its reported data is in the public domain; if the company is privately owned, the documents must still be submitted to government officials, but they are not available to the general public.

The three most common reports created are income statements, balance sheets, and cash flow statements. These three documents are created by a firm's accounting department, and they are then reviewed and approved by an independent auditor (who is paid by the company, so a potential conflict of interest could exist). After they are approved (at times incorporating adjustments required by the auditors) the reports are published for use by investors and government agencies that oversee the firm's business activities and civil society overall. The format of the reports is clearly defined by governmental entities to assure compatibility amongst competing firms.

b. Management Accounting

Management accounting activities and reporting are determined by a firm's management team, and the government has no direct influence over how these reports are created or the format that they take.

Management accounting is the provision of financial and non-financial decision-making information to managers. In other words, management accounting helps the directors inside an organization to make decisions. This is the way to distinguish, examine, decipher and impart data to supervisors to help accomplish business goals. According to the Institute of Management Accountants (IMA), "Management accounting is a profession that involves partnering in management decision making, devising planning and performance management systems, and providing expertise in financial reporting and control to assist management in the formulation and implementation of an organization's strategy." (ref 86)

Management accountants play a crucial role in business in three important ways. First, they are the financial analysis experts. This means they are trained to decipher complex data and not only report on it but also derive what it means for the organization. Management accountants do not stop at documenting costs, losses, and profits. They go "beyond the numbers" to find out the underlying reasons for those outcomes, which entails an intricate knowledge of operations and processes. This is all essential to the reporting and disclosure of important information, whether formally to investors for public companies or more informally to stakeholders at private firms. Management accountants can use data analysis to not just determine the relevant facts but also help identify which activities and operations are most at risk or most contribute to carbon emissions, and how the company can shift toward better management and practices. (ref 16)

2. Private (Corporate) vs Public (Government): Financial accounting only

a. Private Sector

Accounting for the private sector is extremely well documented and closely monitored by a range of associations, securities government oversight groups, and other governmental agencies.

There are two broad ways to manage an entity's book: cash or accrual.

- The cash method is based on recording expenses and revenues at the actual time that funds change hands. If company A wants to sell its product to company B, it records the revenue only when it receives the actual cash.

- The accrual method is based on recording the transition at the time the event occurs. In the example above company A would record the revenue when it shipped the product, and company B would record the expense when the goods were received.

b. Public Sector

Accounting at a governmental level is actually done mostly on a cash basis and is not under the level of scrutiny that private sector accounting is. Many accounting organizations are trying to get governments to move to an accrual method as it more accurately reflects reality, given the complexity of modern global finance.

The IPSASB is recognized as the only real global public sector accounting authority, and they set the International Public Sector Accounting Standards (IPSAS). The IPSASB (International Public Sector Accounting Standards Board), is an independent organization under the umbrella of the IFAC (International Federation of Accountants).

IPSAS are accounting standards for application by national governments, regional (e.g., state, provincial, territorial) governments, local (e.g., city/town) governments and related governmental entities (e.g., agencies, boards, and commissions). IPSAS standards are widely used by intergovernmental organizations or institutions.

The development of IPSASs aims at harmonizing public sector accounting at an international level. IPSASs are intended to generate more comparable financial information across national boundaries and minimize differences in countries' generally accepted domestic accounting principles. Despite the various advantages of adopting IPSASs, the new accounting standards have been accompanied by critiques in terms of implementation costs, lack of pressure, and alignment with public sector specialties. Several countries have decided to (partly) adopt or align traditional cash-based accounting systems with accrual-based accounting systems, such as IPSASs. The implementation of IPSASs, however, has greatly varied across the number of IPSASs applied, as well as countries and government levels. Despite the various benefits associated with adapting governmental accounting (GA) systems to IPSASs, countries such as Finland or Germany are reluctant to change toward an IPSAS-based accounting system. (ref 68).

IPSAS do not apply to government business enterprises.

As it pertains to ESG or climate-change-related fixed assets, there are very few rules but as is discussed later in this paper, the World Bank and the IPSASB are starting to look at the question at a senior policy level.

E. Accounting Rules and Policies

There are set clear rules that govern the issue of an "impaired asset." It is specifically defined by the IASB in IAS 36, which was most recently amended in 2013. This guideline is followed by all countries that are part of the IASB and adhere to IFRS (which is most of the G20 and over another 100+ countries excluding the United States). Instead of IFRS, the United States follows GAAP standards, which are established by the Financial Accounting Standards Board (FASB).

Today, IFRS has become the global standard for the preparation of public company financial statements, and 144 jurisdictions require IFRS standards. Fifteen of the G20 countries have adopted IFRS. China, India, and Indonesia have national accounting standards that are similar to IFRS, while Japan allows companies to follow the standards voluntarily. In the United States, foreign-listed companies may use IFRS and are no longer required to reconcile their financial statements with GAAP.

There are specific accounting rules or guidelines that have relevance to stranded assets: deprecation and write-downs/offs:

1. *Fair value measurement* – IFRS 13 Fair Value Measurement defines fair value as an exit price and requires an entity to use the assumptions that market participants would use when pricing the asset or liability. Fair value is not the value specific to the reporting entity and it is not the specific value to one market participant whose risk assessment or specific synergies may differ from other market participants. (Ref 21)
2. *Impairment* – As noted above, an impaired asset is an asset that has a market value less than the value listed on the company's balance sheet. When an asset is deemed to be impaired, it will need to be written down on the company's balance sheet to its current market value. Key takeaways: (1) Assets should be tested for impairment regularly to prevent overstatement on the balance sheet. (2) Assets that are most likely to become impaired include accounts receivable, as well as long-term assets, such as intangibles and fixed assets. (3) When an impaired asset's value is written down on the balance sheet, there is also a loss recorded on the income statement. (4) GAAP and IFRS have differing standards for impairment. (ref 78)
3. *Materiality or materiality assessment* – The terms imply a process by which the undertaking determines material information on sustainability impacts, risks, and opportunities. This is achieved by the determination of material matters and material information to be reported to the undertaking's sustainability statement. The performance of a material assessment based on objective criteria is pivotal to sustainability reporting which shall include relevant and faithful information about all impacts, risks, and opportunities (IROs) across environmental, social, and governance matters determined to be material from the impact materiality perspective or the financial materiality perspective or both. (ref 50)
4. *Double materiality* – The term implies that from a non-financial reporting perspective an action or subject has both (a) financial materiality and (b) environmental or social materiality on both the climate and the company. This, in turn, affects investors, consumers, civil society, employees, and the planet. (ref 69)
5. *Asset retirement obligations* – An asset retirement obligation (ARO) is a legal or contractual obligation associated with the retirement of a tangible long-lived asset that results from the acquisition, construction, development, and normal operation of that long-lived asset.
6. *Carbon quotient (CQ):* A creative approach that is specific to fossil fuels. "CQ is a set of open-source financial equations and ratios every accountant and financial analyst can immediately grasp. CQ doesn't change the audited financials. Rather, it builds on them. it adjusts the income statement and the balance sheet to reflect a particular "what if" scenario – "what if" this company or this portfolio had to be carbon neutral today, as a matter of law? Would it be profitable? Would it be solvent? Think of CQ like earnings per share or profit margin. It's algorithmic, something a computer can process. This means there are no subjective "expert" assumptions or "black box" methodologies. It's completely transparent. This differentiates CQ from most proprietary carbon metrics. CQ starts by calculating the future emissions embedded in emission-producing long-lived tangible assets over their remaining useful lives. CQ is forward-looking. It captures the future that has already happened. CQ treats this unrealized carbon expense as a contra asset to property, plant, and equipment (PPE), just like accumulated depreciation. On the flip side, CQ treats avoided costs to offset past emissions as a contingent liability. Think of it like a court award in a lawsuit claiming damages for "unjust enrichment" for a company having profited from harming society." (ref 45)

It is important to note that as of 2024, there are no unique rules in place for dealing with potentially impaired assets related to fossil fuel assets. CQ (above), which is not being widely discussed, is an attempt to do this.

Certainty and hard data are the norm for accountants and auditors. They try to avoid subjectivity. Uncertainties do not usually result in asset write-downs.

IV. Recent Activity

A. Organizations involved and standards being set

The subject has been under discussion within several accounting organizations since the early 2000s. Some of the leading and dominant organizations and standards that are critical to accounting overall, and the issue of impaired assets are listed in an Appendix to this paper.

B. Critical concepts being explored/implemented

1. *Information disclosure vs. actual balance sheet adjustments* – Many people, including most of the experts interviewed for this paper, believe that the Corporate Sustainability Reporting Directive (CSRD) has the potential to bridge current accounting rules with the concept of stranded assets. However, the CSRD is an information reporting requirement and not a balance sheet-driven directive.

2. *Double materiality* – A recently introduced concept that is gaining a great deal of attention is double materiality. The term implies that from a non-financial reporting perspective, an action or subject has both: (a) financial materiality and (b) environmental or social materiality on both the climate and the company. This, in turn, affects investors, consumers, civil society, employees, and the planet. (ref 69)

3. *Balance sheet write-downs* – One of the few publicly available examples of firms taking a write-down related to asset impairment tied to public policy are three case studies in the Netherlands. This situation was unique, which is why so much information is available on the subject. For more complete information, look at Section VI of this paper and reference items 26, 83, 84 and 85.

4. *Investors' and lenders' perspective and activity on disclosure – Central banks, securities and exchange government entities, private sector banks, and the overall private investor community have been requesting and continue to look for* full disclosure from the fossil fuel industry on these matters. Unfortunately, at this time, most of the information being shared by the fossil fuel industry is limited or only includes information disclosure and not actual balance sheet or income statement-related financial reporting. Overall, the level of interest in information (quantitative and quantitative) continues to grow, and many believe the current CSRD effort will lead the way at this time.

V. 2024 and Forward

A. CSRD

On 5 January 2023, the European Union's (EU) CSRD came into effect. It requires that a range of sustainability topics be covered in a dedicated section of their annual management reports. The overall aim of the CSRD is to increase accountability and transparency of corporate sustainability reporting and to enable investors to easily obtain comparable sustainability metrics upon which to base investment and engagement decisions. (ref 18).

These rules are seen as the most extensive ever put into effect for corporate financial reporting on sustainability issues and are seen as potentially a major shift in transparency related to climate change and other ESG issues. In the past, companies have often published their sustainability activity in a separate report; the CSRD will now make it part of its financial reporting and thus make it subject to a review by an auditor. The biggest companies in the EU will have to apply the new rules for the first time for the 2024 financial year, for reports published in 2025.

B. ISSB

The ISSB was launched by the IFRS Foundation at COP 26 with the aim of improving the consistency and quality of sustainability reporting across the globe, by matching the importance of sustainability reporting with the current regulations around financial reporting. To reinforce this message, the ISSB sits alongside the IASB and is overseen by the trustees of the IFRS Foundation and the Monitoring Board. The ISSB brings together the

Climate Disclosure Standards Board (CDSB) and the Value Reporting Foundation (VRF), the name behind the Integrated Reporting Framework and the SASB Standards. (ref 88)

The ISSB (which includes the IRFS Foundation's work) held a board meeting in 07/2024 and published the Exposure Draft *Climate-related and Other Uncertainties in the Financial Statements*. The Exposure Draft proposes eight examples illustrating how an entity applies the requirements in IFRS Accounting Standards to report the effects of climate-related and other uncertainties in its financial statements. (ref 87). The IASB tentatively decided (a) to provide examples to illustrate how an entity applies IFRS Accounting Standards to report the effects of climate-related and other uncertainties in its financial statements; (b) to include the examples as illustrative examples that would accompany IFRS Accounting Standards; and (c) to publish an exposure draft to obtain feedback from stakeholders about the examples. (ref 87)

C. Implementation of IFRS S1 and S2

On 26 June 2023, the ISSB released its first two International Sustainability Disclosure Standards that become effective for periods beginning on or after 1 January 2024.

- IFRS S1: General Requirements for Disclosure of Sustainability-related Financial Information
- IFRS S2: Climate-related Disclosures

These two standards are designed to cover activities commencing on 1 January 2024 (i.e., so the material will become public in 2025 for the period of 2024). (ref 88)

D. Double Materiality into Force

With the CSRD now actually in effect (as of 1/1/24), the principle of double materiality is now going to be put to its first official test. Watching this effort from outside the EU (particularly in China, Japan, and the United States) could have major potential effects on how companies in the three largest national economies report on climate and sustainability issues.

The CSRD establishes that sustainability reporting shall be based on the principle of double materiality (referred to in this document as "materiality"). There are two dimensions to double materiality: impact materiality and financial materiality when identifying the information to be disclosed. A sustainability matter can be material from an impact perspective, from a financial perspective, or from both. (Ref 50).

E. IPSASB and World Bank – 1st Public Sector Sustainability Reporting Standard

The need for governments to report on their actions related to sustainability and climate change, in particular, has continued to grow. The World Bank noted in *Sovereign Climate and Nature Reporting: Proposal for a Risks and Opportunities Disclosure Framework* in January of 2022 that 40% of the USD 100 trillion global bond market was issued by governments (ref 65 and 64). With this as a background, the World Bank and IPSASB established a working group in 2023 that will create the 1st Global Public Sector Reporting Standard. The goal is to publish a draft for public comment in the late 4th quarter of 2024. (ref 73 and 74)

VI. Case Study: Coal power plants - Netherlands

There are very few cases of publicly available information where one can see the financial impact of government action and a fossil fuel corporation's balance sheet. One example is found in the Netherlands in regard to three power companies that sued the government for damages but lost in court.

Most power plants are owned by large multinational energy companies. Given that the individual power plants are part of a larger corporate entity, as a rule, they do not need to make plant-level data available to shareholders or civil society. However, this situation involved the three firms as plaintiffs in lawsuits, and they were, in turn, required by the court to provide plant-level data.

The following series of events occurred:

- These power plants came online later than other coal plants in the Netherlands.

- The Netherlands signed the Paris Climate Agreement.
- The price of coal-generated electricity became less valuable.
- In July 2019, the Dutch parliament passed a national law aimed at achieving the Paris Goals, followed by a related December 2019 law that prohibits the use of coal for electricity generation effective 1/1/2030. This was a new foundational building block for the Netherlands to achieve its targets.
- Lawsuits filed.
- The courts ruled in all three cases in favour of the government.
- The firms further wrote down the asset values on their balance sheets (exact amounts and timing are included in Appendix B).

The top-level facts of the three individual lawsuits are very briefly summarized below. The full court documents can be found via URLs as part of references 83, 84, and 85.

- The Eemshaven power station, owned by RWE who filed a claim against the Dutch government for EUR 1.46 billion. The amount of this claim was based on an independent assessment by RWE's contractor, Brattle, of EUR 1.54 billion (hypothetical value assuming the plant can operate until it is fully depreciated) and at EUR 79 million (current value given the government's policy to shut down coal-fired electricity production fully by 2030), resulting in a difference of EUR 1.46 billion.
- The Amercentrale power station, which is another coal-fired power plant owned by RWE, who filed a claim for EUR 62 million.
- The third court case in the Netherlands involves Uniper, Benelux, which owns the MPP3 (e.g., Maasvlakte Power Plant) power plant. In this case, no numbers were presented by the plaintiff as "Uniper further demands that the court order the State to pay damages, to be determined by the state."

The three plants have, over the last decade, taken significant impairment write-offs, as can be seen in the tables and explanations included in Appendix B. (ref 26)

VII. Conclusions

The accounting profession and securities regulators around the world will continue to push forward with greater sustainability- and climate change-related information disclosure being required of corporations.

It is expected the EU's CSRD will become the standard by which others are measured.

With the rollout of IFRS S1 and S2 on a global basis in connection with the CSRD in the EU, we will in 2025 begin to see the impact of these new requirements. They will begin to provide a great deal more information and data to investors, but it will have no direct link to how entities value (e.g., accumulated depreciation) their hard assets on their balance sheets.

On the public sector front, there will continue to be slow movement on governments reporting on their climate actions in regard to accounting for hard assets. The IPSASB and Worked Bank initiative will continue to get the subject more attention in an ever-growing circle of professionals and experts on the subject. Since many of the fossil fuel assets are actual, or in theory, on the books of governments, this will have a significant effect if the information starts to become more transparent. It is critical to remember that about 40% of all fixed-income products (bonds and other securities) sold on public exchanges worldwide are government-, not corporate-issued securities.

The accounting profession, which also includes the auditors hired by firms to validate their "books" has traditionally and will continue to be a cautious profession that tries to minimize or virtually eliminate subjectivity in regard to how numbers are reported and/or radically change policies (e.g., redefining what is an impaired asset and how its value can or should be adjusted). It is unlikely that the accounting profession will lead requiring firms or governments to write down or write off these assets without national governments passing regulations and laws that require the assets to stop being used for their current designated purpose (e.g., burning coal to make electricity or an oil rig to pump oil).

Public policy continues to maintain its key role as a driver. “The implementation of ambitious near-term climate policy by governments is essential to avoid investments in new carbon-intensive assets that might later be impaired or stranded. To limit future disruptions from existing assets at risk of being stranded, governments will need to rapidly phase out fossil fuel-based infrastructure while developing new low-carbon alternatives in a considered way.” (ref 34)

The introduction of special impairment accounting guidelines and rules regarding fossil fuel assets would have a huge impact, but based on the current status of activity, this action is most likely still many years away and may only be necessitated by a major economic crisis tied to material write-downs of a sector of the fossil fuel industry.

VIII. Recommendations

Government policy: National government policies need to be established regarding specific activities with clear effective dates for when the stated activities will no longer be allowed.

Make disclosure and transparency the new norm: Major economies, including China, should examine ways to harmonize their emerging accounting rules with the EU’s CSDR.

Public sector accounting: The World Bank's joint effort with ISPASB on public sector accounting guidelines related to climate change should be expanded to include senior representatives from leading global economies.

Special treatment for fossil fuel assets: IFRS should explore the establishment of a specific working group focused on balance sheet revisions unique to fossil fuel-related assets. The accounting profession (led by IFRS) should explore the possibility of establishing special guidelines and principles for depreciation and how an impaired fossil fuel hard asset is defined.

Appendix A. Organizations/Standards Linked or Involved With Accounting for Impaired Assets

ACCA – Association of Chartered Certified Accountants

CCRF - Climate Change Reporting Framework

CIMA – International Integrated Reporting Council

CRI – Corporate Finance Institute

ESRB – European Systemic Risk Board

ESRS – European Sustainability Reporting Standards

FASB - Financial Accounting Standards Board (United States only)

GAAP - Generally Accepted Accounting Principles (Set by the FASB – United States only)

IASB - International Accounting Standards Board

IFAC – International Federation of Accountants

IFRS – International Financial Reporting Standards (Set by the IASB)

IPSAS – International Public Sector Accounting Standards

IPSASB – International Public Sector Accounting Standards Board

ISSB – International Sustainability Standards Board

PCAF – Partnership for Carbon Accounting Financials

Appendix B. Coal Power Plants – Netherlands (ref 26)

Estimated asset valuations of the Dutch coal plants.

The owners of the three new coal-fired power plants have stated at various times that the plants have cost a total of more than €6 billion and that their plants will only have depreciated for half their value by 2030. However, new analysis by think tanks Ember (opens in new window)and IEEFA(opens in new window), in collaboration with SOMO, suggests that the three plants are already loss-making and have been largely written-down. This is not only due to the Dutch coal phase-out law, but also due to the uncompetitive economics of coal-fired power generation in general, driven by a rising carbon price and cheaper energy generation from renewables and gas plants.

Financial statements of the Dutch RWE subsidiary, RWE Generation NL Participations B.V., indicate that Eemshaven had a "carrying amount" of €1.2 billion in assets on the balance sheet in 2016. However, it also had €1.2 billion in financial liabilities, meaning its equity book value, or the accounting-based value to its owners, had already gone down to zero, years before the Dutch coal ban came into effect and despite the abolition of the Dutch coal tax as of 1 January 2016.

Figure 1 shows how RWE's original planned €2.7 billion investment in Eemshaven (which ballooned to €3 to 3.2 billion) has rapidly collapsed in value, with only €0.4–0.7 billion of that reduction explicitly attributed to the Dutch coal phase out law, based on RWE's financial reports since 2010. The huge write down in 2013 was attributed(opens in new window) to "the current assessment of the medium to long-term development of electricity prices, the regulatory environment, and the lower utilisation of parts of the fossil-fuelled power plant portfolio". If the plant had operated as planned, Figure 2 would have shown a straight line gradually decreasing to zero over the power plant's 30-to-40-year lifetime. This gradual decrease would signify the plant losing value year on year as its expected productive period comes closer to its end. Instead of this gradual decrease, however, the figure shows the sharp decline in RWE's own valuation of its Eemshaven plant, as the economic conditions for coal-fired power plants continuously worsen. Only the relatively small drop in value in 2019 is actually related to the Dutch coal ban.

Figures 2 and 3 show that Uniper and Engie/Riverstone have made significant write-downs on their coal plants as well, although both seem to largely blame regulations for much of their impairments. Uniper's reporting suggests that up to €1 billion of impairments at its Maasvlakte 3 power plant were explicitly attributed to the Dutch coal phase-out regulation.

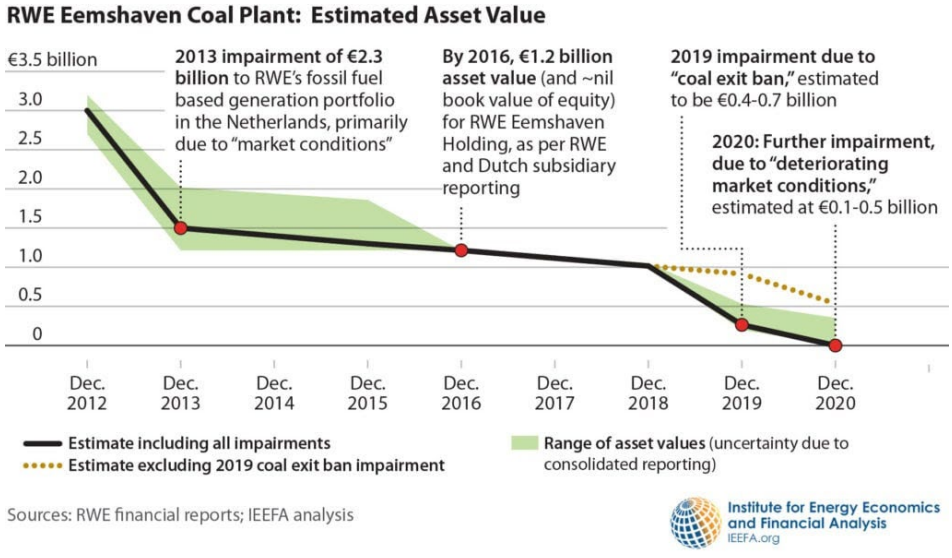

Figure 1 Estimated asset value of RWE Eemshaven plant

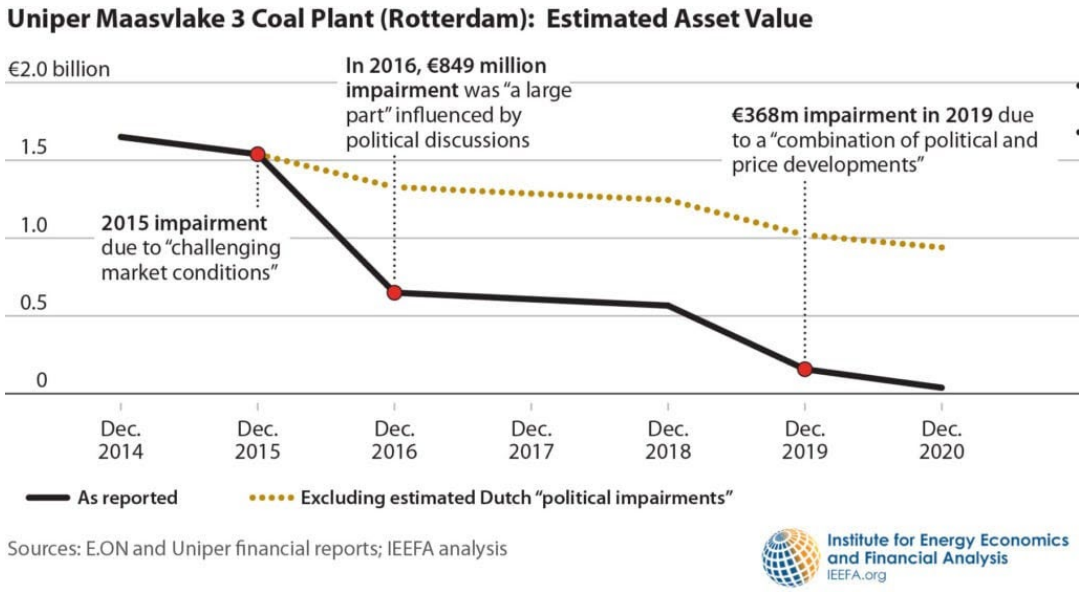

Figure 2 Estimated asset value of Uniper Maasvlakte 3 plant

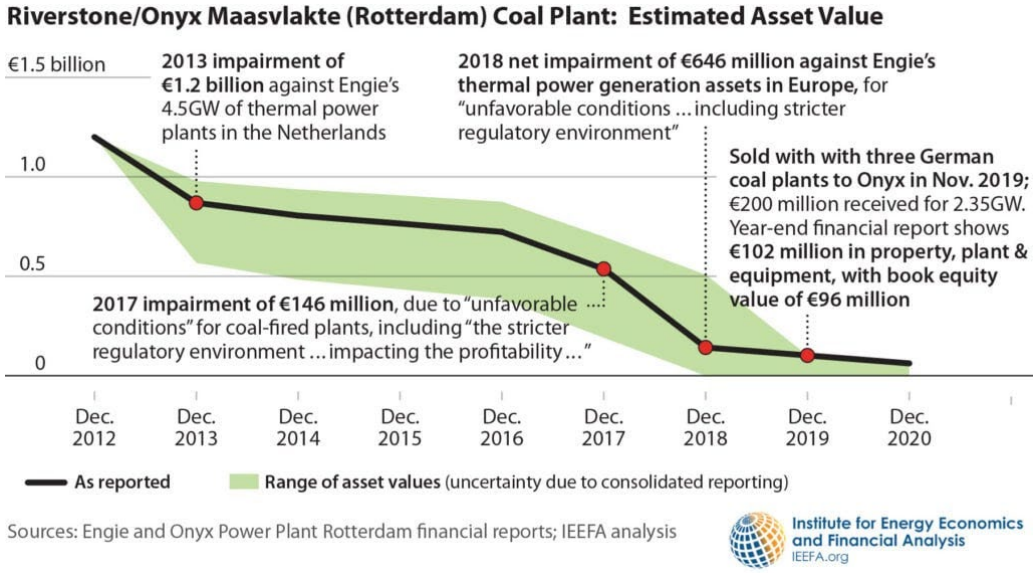

Figure 3 Estimated asset value of Riverstone/Onyx Maasvlakte plant

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