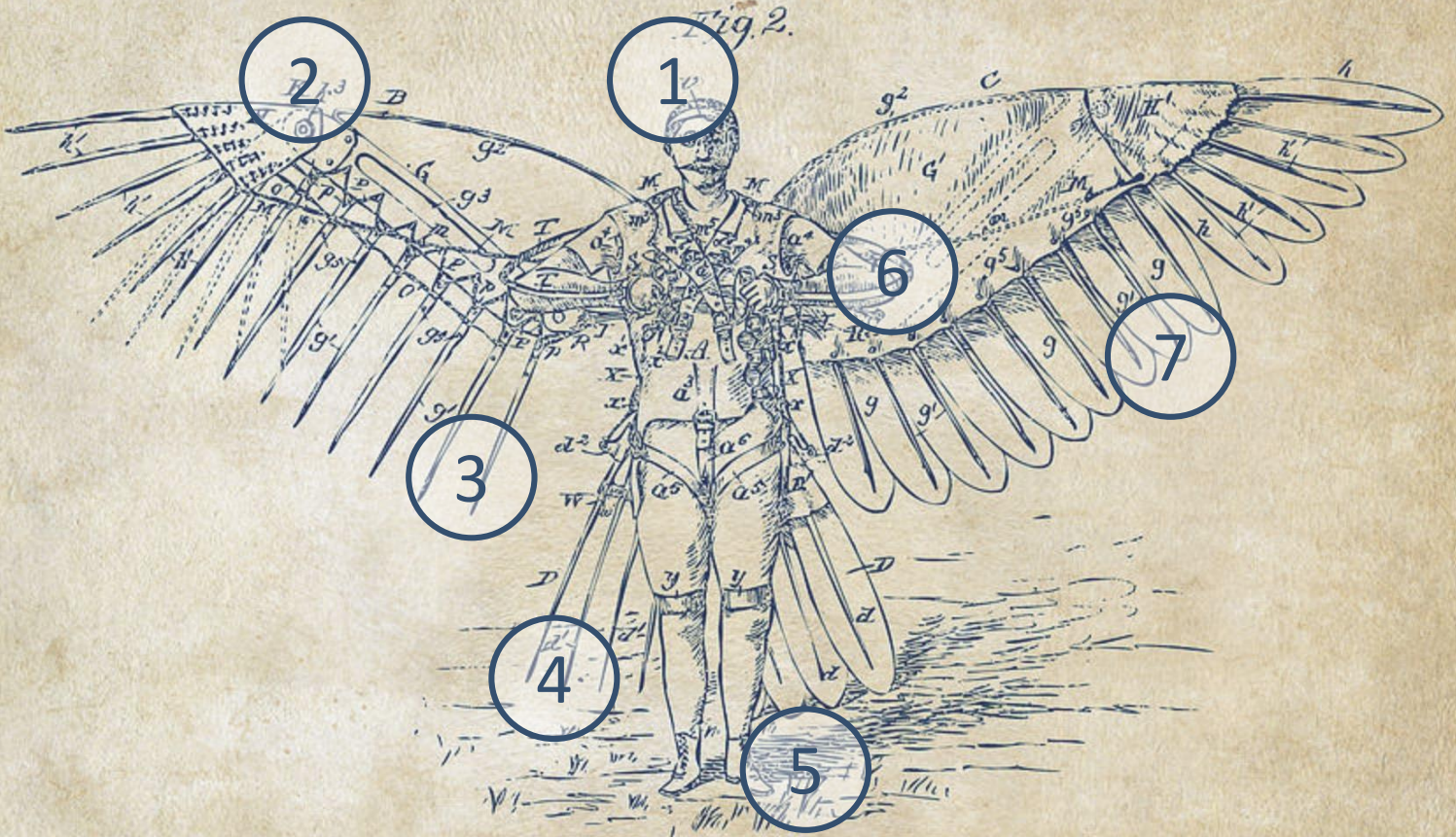# CLIMATE DISCLOSURE: HOW TO MAKE IT FLY

FROM ANNUAL REPORTING TO PHYSICAL ASSET-LEVEL DATA

WHY CAN'T CLIMATE DISCLOSURE FLY?
THE 7 DESIGN FLAWS OF THE CURRENT CORPORATE REPORTING PARADIGM

1. EQUITIES ONLY. Existing climate-related corporate disclosure frameworks and initiatives focus mainly on large cap listed equities (indirectly covering listed corporate bond issuers). In turn, and partially as a result, most ESG data providers only cover the listed corporate space. This leaves behind major climate-relevant asset classes (private equity, sovereigns, municipalities, real assets, ABS) that can represent upwards of 50% of an institutional investor portfolio.

2. NON-REPORTERS. Even among listed companies, after almost 20 years of pressure, reporters represent only 42% of high impact sectors (CDP 2015). When considering product-related and Scope 3 emissions, this shrinks further.

3. AGGREGATED. Carbon accounting standards (GHG Protocol, ISO 14064), designed for tracking of organizational performance over time, allow reporters to use different consolidation rules (equity share, operational control, financial control), making comparisons between seemingly similar reporters difficult (CDP 2015). Such approaches also combine emissions from physical assets exposed to policy or technology risk (e.g. power plants) with 'irrelevant' assets (e.g. corporate auto fleets, headquarters buildings) and tend to aggregate over key indicators (e.g. geography of assets, age).

4. DATA QUALITY. Even when report, the quality of carbon emissions data is often poor and requires assurance by CDP and third parties. By the time this 'assured' data is available, it may be out of date and is subsequently less useful. Standard practice consolidates past emissions at company level once a year, with reported data sometimes 1-2 years behind, hindering analysis of future risk exposure or alignment with climate targets.

5. NO BENCHMARK. Corporate carbon emissions or emission intensity are not meaningful to potential users if they cannot be compared with regulatory thresholds or carbon budgets allowed in decarbonization (e.g. 2°C) scenarios. Very few companies to date report GHG emissions with such context. External frameworks are limited.

6. CO_2 DOESN'T CAPTURE 'GREEN'. Requested disclosure metrics generally focus on 'brown' activities through a focus on emissions and reserves, forcing companies to report their 'green' activities as 'reductions in brown'. Carbon is not the right indicator in particular for green asset deployment and R&D, neither of which directly affect company emissions.

7. NO TIME LEFT. Climate mitigation is time sensitive. It took 20 years to get here and will likely require another 10 for governments / private initiatives to fix these problems under the current paradigm. Shortcuts are needed.
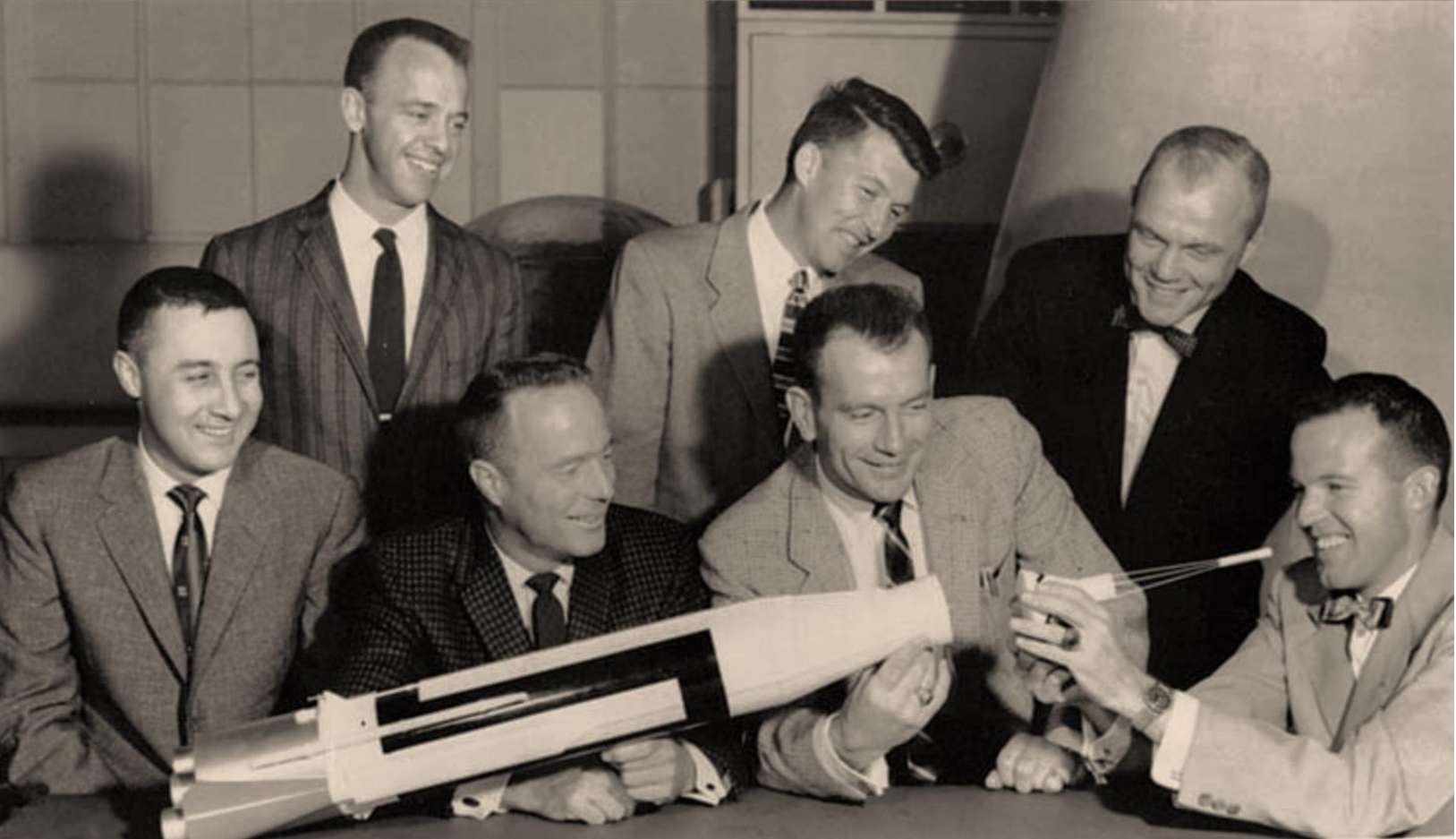
THE POTENTIAL OF PHYSICAL ASSET-LEVEL DATABASES

Asset level data opens up new possibilities for both the assessment of climate goal alignment (i.e. alignment of financial flows with <2°C) and climate-related risk:

CLIMATE GOAL ALIGNMENT. The SEI Metrics research consortium and the Sustainable Finance Programme at the University of Oxford's Smith School (the 'SFP') have demonstrated how asset-level data can test regions (top figure), markets, companies, and financial portfolios (bottom figure) against required buildout/retirement of different technologies in a 2°C scenario. Importantly, such data are forward-looking, showing *actual capex plans* with rich geographical and technological detail, as opposed to corporate targets that may or may not be reached. Research in ongoing projects can expand the sector coverage of such analysis and add additional layers (e.g. forward-looking GHG emissions), and expand available scenarios beyond the commonly used IEA World Energy Outlook scenarios.

TRANSITION RISK EXPOSURE ANALYSIS. Asset level data also allow a detailed view of how transition risk could affect a company by clarifying its exposure to different technologies, regions, and markets. The work of the Carbon Tracker Initiative on fossil fuel cost curves is a case in point. The EU-funded ET Risk project (pg.. 9) has begun creating a comprehensive database across 6 sectors that could support this analysis. Importantly, such data is useful for evaluating other environmental risks as well (e.g. clean air policy).

PHYSICAL RISK EXPOSURE ANALYSIS. Given their geographical specificity, asset-level data have a clear advantage over corporate reporting for assessing physical climate risk as well. Such data can be overlaid with information on climate patterns, water stress, etc. (e.g. Caldecott et al. 2016).

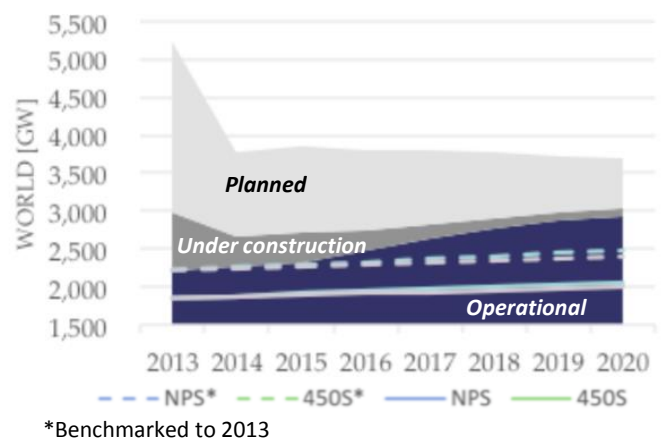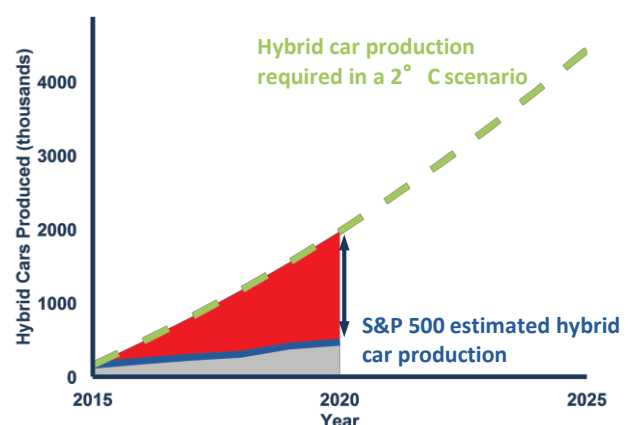**FIG. 1: GLOBAL COAL PLANTS VS. IEA SCENARIOS (SOURCE: CALDECOTT ET AL. 2016)**

*Benchmarked to 2013

Fig. 2: ALIGNMENT OF SAMPLE PORTFOLIO WITH 2°C HYBRID AUTOMOBILES (SOURCE: 2DII 2015)

# THE CURRENT LANDSCAPE OF PHYSICAL ASSET-LEVEL DATABASES

SUMMARY. Databases exist for the majority of assets directly linked to and affected by the transition to a low-carbon economy. A non-comprehensive sample is given from previous research in the table below. No comprehensive landscape of such 'climate-relevant asset databases' exists to date. 2Dii, in partnership with ADEME, is currently conducting a landscape review to be published in the fall 2016 (pg.. 9).

AVAILABLE INDICATORS. Databases vary in the indicators available. Most that deal with stationary assets (e.g. plants) offer partial geolocation data (latitude/longitude), potentially allowing a rich assessment of physical climate risk if enhanced with additional layers (Caldecott et al. 2016), but all offer at least country-level specificity. Most also contain information on the asset's age and/or useful remaining lifetime (Fig. below). Relatively few already contain information on GHG emissions (e.g. CARMA for power), but nearly all offer some level of technological description (drivetrain type, fuel used, specific model number, turbine type, emissions control technology) and usage characteristics (annual production and/or capacity, heat rate, capacity factor, etc.) that can be used to estimate such emissions at asset-level.

OWNERSHIP/OPERATORSHIP: A KEY ISSUE. Importantly, many asset-level databases are not primarily used by the financial sector, and thus not all have fully mapped the complex ownership chains from subsidiaries to parents to securities. A database might list a plant operator based on public emissions reporting for the plant but not necessarily connect that company to its final parent owner or to the financial exposure of the parent company in the subsidiary.

Sectors	Databases
Oil & gas	WoodMackenzie, GlobalData, Rystad, Platts
Coal	WoodMackenzie, SNL Financial
Power	GlobalData, Platts, Enerdata, CARMA
Automotive	WardsAuto, Automotive World, IHS, Marklines, PowerSys
Aviation	CAPA, FlightRadar24, FlightGlobal Ascend
Shipping	Clarksons, Lloyds, Rightship, IHS Maritime Industry
Cement	Int.Cement Review, Global Cement Directory
Steel	Plantfacts
Cleantech	i3, IEA, Bloomberg New Energy Finance
Real estate	Geophy

FIG. 3: AVERAGE AGE OF POWER PLANTS FOR A SAMPLE UTILITY (SOURCE: 2DII 2015, GLOBALDATA)
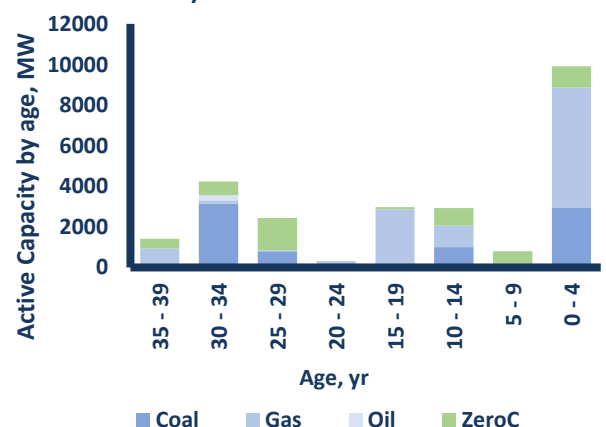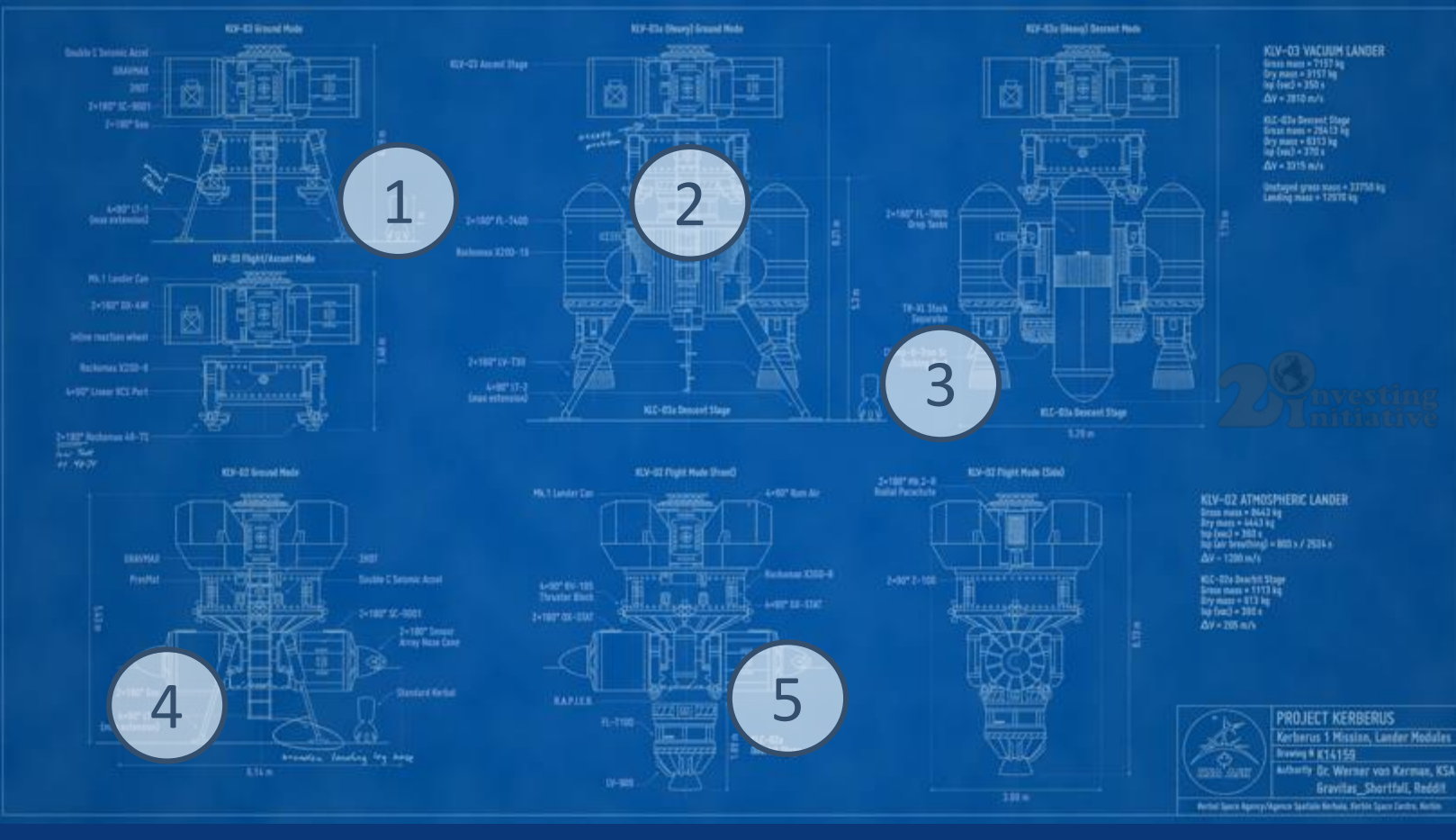
A BLUEPRINT FOR A NEW CLIMATE DISCLOSURE FRAMEWORK

1. LINKING PHYSICAL ASSETS TO SECURITIES. 2Dii and SFP have between them matched physical assets (e.g. plant) with their listed owner and related stock identifiers (e.g. Bloomberg ticker, ISIN), covering the listed space for three sectors to date. Together with the University of Zurich, the next step (2016-17) involves harmonizing consolidation rules and extending the analysis to non-listed and state-owned companies, as well as other sectors and asset classes.

2. CREATING A FEEDBACK LOOP. In order to inform the investor-company dialogue and perfect data quality, a feedback loop could imply third-party data validation by companies. CDP, ADEME and 2Dii have started to test the willingness of companies to validate third party data on the physical assets they own and operate. Initial feedback has been positive, with companies seeing this as an opportunity to reduce the reporting burden while improving standardization. The next steps involve road-testing the feedback loop and potentially deploying it at large scale via the CDP questionnaire.

3. TOWARDS A ONE-STOP SHOP. 2Dii has created a preliminary 'one-stop shop' for investors, gathering data from several asset-level databases for three sectors and treating the data to inform equity portfolio climate analysis (alignment with IEA 2°C roadmap). In 2016, the information is available to investors for free (60 users to date) in the context of road-testing, often through an ESG provider. Several providers are exploring commercialization. A climate-relevant, physical assets database model is being co-developed by the SFP and 2Dii in the context of the ET Risk project (pg. 9). Eventually, these initiatives can lead to a one stop shop bringing data and models and reporting together. A benefit of such a 'one-stop shop' would be the ability to track the realization of climate policy goals, from physical assets to financial flows by policymakers, research, and other external stakeholders

4. CONNECTING THE DOTS WITH INVESTMENT FUNDS. The University of Zurich and 2Dii are exploring coupling physical asset-level databases together with equity portfolio composition data (from Morningstar) to come up with an analysis of equity funds alignment with climate goals. The publication is expected in 2016. The next step will involve exploring a permanent climate labeling scheme that can be implemented without necessarily relying on issuers or even asset managers climate reporting. This can be linked to existing regulatory initiatives (e.g. the review of EU Packaged Retail Investment and Insurance Products Directive (PRIIPS) in 2018). ADEME and 2Dii are researching potential options, as well as technical barriers to integrating climate considerations into retail investment decisions across 10 countries.

5. CREATING A TARGET SETTING INTERFACE. The next steps would build on the 2D portfolio assessment tool developed by 2Dii to develop an interface allowing investors to set decarbonization targets at portfolio level and connect these targets into shareholder engagement requests for investees. Such an interface would similarly allow companies to understand if their climate targets match the expectations of their shareholders. The interface can also be linked to other overlays such as those developed by the SFP.

5

BOOSTING THE USE OF PHYSICAL ASSET-LEVEL DATA

Reporting 'in a vacuum', without genuine users for the data, cannot generate the virtuous cycle that is required for continuous improvement of data quality and relevance. Creating a sustainable demand is therefore as important as the design of disclosure frameworks themselves.

1. BOOSTING INVESTOR DEMAND. A growing number of investors plan to assess their portfolio on climate-related issues and set related targets in the context of voluntary commitments (Montreal Pledge, Portfolio Decarbonization Coalition) and the French law on mandatory disclosure. These practices are likely to develop further in the next few years, thanks to other countries looking to strengthen disclosure regimes for investors , and potential recommendations of the FSB's Taskforce on Climate-related Financial Disclosure (TCFD) for investors.

2. BOOSTING SUPPLY. This trend creates an opportunity for ESG data providers, organizations behind mainstream financial databases and tools (e.g. portfolio optimization tools), and / or research providers (e.g. universities) to become retailers of cross-sector, physical asset-level data that integrates a range of asset-level indicators and is linked to scenarios, risk models, and various other overlay information (e.g. natural catastrophe models). Some commercial and non-profit actors have begun this process. The next steps of adoption involve the integration of these data into portfolio analytics tools and their use in the context of climate labeling schemes for funds (France), regulated investment product leaflets (PRIIPs at EC level), and awareness raising campaigns targeting retail investors. Oxford University, 2Dii, and the French Environmental Agency (ADEME) are currently exploring these avenues through several research projects (pg. 9).

3. CREATING A GLOBAL CAPITAL MONITOR. Besides investors, policymakers and international organizations like the IEA, the OECD, and the G20 are the natural end-users of data related to the alignment of companies activities and financial flows with climate targets. The Paris Agreement, which refers to this alignment of financial flows explicitly in Article 2.1(c), provides a clear mandate for setting up an international monitoring mechanism. The IMF, who recently acknowledged its role in helping its members address financial policy challenges related to climate change, could be a potential host for such an observatory, as could be similar organizations with policy leadership in this field (e.g. FSB / BIS, OECD, UNFCCC, etc.).

4. MONITORING FINANCIAL STABILITY RISKS. Beyond the alignment of actual investments with policy goals, the role of such an observatory could extend to the assessment of long-term financial risks related to the energy transition and climate change, both for financial institutions and financial stability. France recently introduced mandatory climate stress tests for its finance sector (Art. 173 of the Energy Transition Law). In 2016, the European Systemic Risk Board (ESRB) advisory scientific committee called for the generalization of similar stress tests. Such stress tests have not been experimented yet, but physical asset-level databases will certainly be a useful tool to implement them. In particular, a Climate Capital Monitor can help inform regulators on the extent to which current investments are misaligned with a 2°C transition and may thus be at risk under a sudden policy shift towards 2°C at a later stage.

ROLE FOR CORPORATE DISCLOSURE AND NEXT STEPS

The mobilization of physical asset-level databases to inform investors and financial sector analysis can be a giant step for climate data, but it is no silver bullet. These databases come with a number of gaps. Some of them can be fixed, others will likely require gap filling through corporate disclosure. The use of these databases should therefore be seen as a way to reduce the corporate disclosure burden and focus efforts on the most strategic items rather than as an alternative to corporate reporting altogether. In particular, company level disclosures should focus on market positioning (especially innovation and R&D) and risk management practices, as shown in the table below.

Current gaps	Responses already planned	Research needs	Gaps likely to remain
Most sectors are not covered (see page 4)	In the context of SEIM and ET RISK projects, the list of sectors will be extended to new industries for which asset-level databases exist	Key sectors like real estate and urban infrastructure will require the consolidation of national databases or the creation of new databases.	Many industries will never be covered by these databases. In this case corporate disclosure will remain the main source of information
Roadmaps/ scenarios -> Benchmarks	Science-based Targets Initiative and SEI Metrics have already developed benchmarks using IEA and some other scenarios.	Mapping the scenario envelope more fully and matching scenarios to user beliefs to enable investors to choose scenarios easily	No one perfect scenario will ever be designed that would cover all users' needs and cover all industries
Innovation/ R&D	Proposed work would extend the concept of science-based alignment to innovation/R&D as part of the EU 'ZCARB' consortium	Theoretical work to define R&D targets for deep decarbonization; reporting best practices	Corporate reporting of zero carbon R&D faces a confidentiality ceiling
Risk management practices	Large effort in corporate reporting to date	Further streamlining and definition to connect management disclosure to assets; potential standardization of scenarios	Annual corporate reporting is likely to remain the main source for such disclosure

ANNEX: OVERVIEW OF CURRENT ASSET-LEVEL DATA PROJECTS

SUSTAINABLE ENERGY INVESTMENT METRICS PROJECT (SEI METRICS)

This project, a collaboration of 8 core partners + contractors (EY, Accenture, Beyond Ratings, ET Advisors) funded by the EU (€3m), is creating a framework to measure the exposure of financial assets, and financial portfolios and loan books to the 2°C economy. Currently asset-level data, linked to listed equities, are used in three sectors: **Power, automotive, and oil & gas**. The project launched the first benchmark for listed equity in September 2015. The methodology is now being tested by over 60 investors. Expansion to other sectors (real estate, airlines, steel, cement) and asset classes is planned in the next phase of the project.

ENERGY TRANSITION RISK & OPPORTUNITY PROJECT (ET RISK)

This project, a collaboration of 7 partners also funded by the EU (€2.2m), will create a framework to assess credit and equity risk and opportunity associated with the energy transition across six sectors: **Power, automotive, aviation, shipping, steel, and cement**. The project will develop asset-level databases of "locked-in"/committed emissions associated risk metrics within these sectors.

SUSTAINABLE FINANCE PROGRAMME, UNIVERSITY OF OXFORD ASSET-LEVEL INITIATIVE

The Sustainable Finance Programme has developed the most comprehensive database of asset-level information on coal-fired power stations and environment-related risk overlays currently available. This work integrates data from a wide range of sources and is constantly being updated. This effort is being extended to other areas. The University of Oxford is also exploring how to establish an Asset-level Data Initiative (ADI) with 2Dii and others, with the aim to make as much asset-level data publicly available as possible. This global public goods initiative is at an early stage, but could underpin many of the ideas raised in this discussion document.

ASSESSING THE LOW CARBON TRANSITION (ACT) INITIATIVE .

The Assessing the low Carbon Transition (ACT) Initiative seeks to develop an assessment framework for the alignment of companies with the energy transition, initially in three sectors: **power, automotive, and retailing**. The project is exploring using physical asset data to assess companies' alignment, including a validation step whereby companies verify their current and future asset pipeline. It is lead by ADEME and CDP in partnership with 2Dii and the EIB.

ASSET-LEVEL DATA LANDSCAPE REVIEW.

2DII, in collaboration with ADEME, will produce a landscape of asset-level climate-relevant data across 10 sectors. This small project, funded by ADEME and the EC, will produce a summary of all major climate-relevant asset-level databases, including their strengths and weaknesses for climate performance measurement.

SEI METRICS CONSORTIUM

ET RISK CONSORTIUM

APPROXIMATE TIMELINE FOR DELIVERABLES FROM RELEVANT INITIATIVES

Project	First results
SEI Metrics: 2C Portfolio Tests	Q1 2016
ET Risk Asset Database	Q2 2017
ACT Initiative	Q4 2016
Asset-level Data Initiative	Initial Planning
Data Landscape	Q3 2016

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ABOUT 2° INVESTING INITIATIVE

The 2° Investing Initiative [2°ii] is a multi-stakeholder think tank working to align the financial sector with 2°C climate goals. We are the leading research organization on climate-related metrics for investors. Our research work seeks to align investment processes of financial institutions with climate goals; develop the metrics and tools to measure the climate friendliness of financial institutions; and mobilize regulatory and policy incentives to shift capital to energy transition financing. The association was founded in 2012 and has offices in Paris, London, Berlin, and New York City.

CONTACT

ABOUT OXFORD SMITH SCHOOL

The Sustainable Finance Programme at the University of Oxford's Smith School of Enterprise and the Environment was established in 2012 (originally as the Stranded Assets Programme) to understand how finance and investment intersects with the environment and sustainability. It seeks to understand environment-related risk and opportunity, both in different sectors and systemically; how such factors are emerging and how they positively or negatively affect asset values; how such factors might be interrelated or correlated; their materiality (in terms of scale, impact, timing, and likelihood); who will be affected; and what affected groups can do to pre-emptively manage risk. The Programme develop the data, analytics, frameworks, and models required to enable the integration of this information into decision-making.
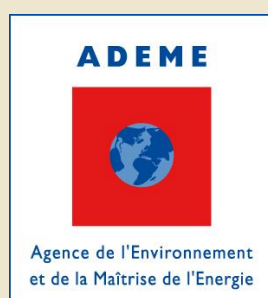
CONTACT

REFERENCES

(2dii 2013) From financed emissions to long-term investing metrics. State-of-the-art review of GHG emissions accounting for the financial sector

(2dII 2015) Assessing the Alignment of Portfolios with Climate Goals : Climate Scenarios translated into a 2° C Benchmark

(Caldecott et al. 2016) Stranded Assets and Thermal Coal: An Analysis of Environment-related Risk Exposure

(CDP 2015) Modeling of Corporate GHG Emissions Methodology

(CDP 2016) Carbon Action 2016

(PCI 2015) Climate Strategies and Metrics: Exploring Options for Institutional Investors