# Understanding the 2 Degree Scenario Analysis Outputs

This document describes the Key Concepts, Output Files, and Data associated with the scenario analysis outputs.

## Key Concepts

### Sectors and Technologies

The asset-level data behind this analysis covers production in 8 sectors. Sectors covered by the Scenario Analysis are Oil&Gas, Coal, Power, and Automotive. Sectors covered within the Emissions Intensity Analysis are Shipping, Aviation, Steel, and Cement.

A technology is a method of production within a sector. In general, technologies within a sector produce fungible outputs, and will vary by their relative “brown”- or “green”-ness. For example, electric vehicles and gasoline engine vehicles are both considered as “passenger vehicles” (fungible); electric vehicles are considered the “greener” technology option relative to gasoline engines. Examples of technologies within a sector include:

1. Power sector: Coal-fired, gas-fired, nuclear, hydro, and renewable capacity
2. Automobile sector: electric, hybrid, and gasoline engine vehicles.

### Production vs Capacity

Asset-level data is distributed by data providers as either production or capacity (which would require additional application of a utilization factor to generate production values), depending upon the Sector. For example, fossil fuels and automotive sectors have production data (for example, number of vehicles produced in a year), while data for the power sector is in terms of capacity (MW of installed electric generation capacity).  
In the text below, note that the term “production” is used in a generic sense to encompasses either production or capacity, depending on the sector.

### Current Plans vs Plans “consistent with the scenario”

Data on companies’ production and installed capacity plans is referred to as the company’s “current plans”. In other words, these are the forward-looking production/capacity numbers purchased from asset level data providers. Columns in the output files with current plan data have the “Plan.” prefix.  
Columns in the output files with the “Scen.” prefix provide production/capacity plans consistent with the specified scenario. Data in these columns take the initial year production as a starting point, and then apply the changes specified by the scenario in order to produce an alternate set of production/capacity plans that are consistent with the scenario.

Allocation Methods/Accounting Principle  
[!! These mean the same thing – need to define and sort this out consistent naming]

## Outputs

### Audit Files

The files below can be used primarily for auditing how securities in the input portfolio map to physical asset data, and therefore contribute to the overall results.   
[!! NOTE: Not sure if we would actually send all these files, or send them but with a subset of the columns. Also Files in the table below need a better name]

|  |  |  |
| --- | --- | --- |
| **Type of Data** | **File Name** | **Purpose** |
| Portfolio data | ++ ALLPortfolioInput.csv | The original data set provided for the analysis, with additional columns identifying which rows/securities are included in each asset class and aspects of the analysis, and also how they roll up to company level.  Useful for identifying the role each security plays in the overall results. |
| Companies in the portfolio mapped to 🡪  company asset-level data | ++ Equity-PortInput-ALD-AUDIT.csv ++ Bonds-PortInput-ALD-AUDIT.csv | Shows how each company held within the equity and bond portfolios maps to companies in the asset-level data, and therefore to their production/capacity. |

### Results Files

The remaining output files contain the actual results from the scenario analysis model—e.g., the portfolio’s forward-looking production and capacity profiles in the sectors covered by asset-level data. Data in these files provide the bulk of the information used in the automated PDF reports.

|  |  |  |
| --- | --- | --- |
| **Type of Data** | **File Name** | **Purpose** |
| Forward-looking production/capacity data, aggregated to company level | ++ Equity-PortInput-Comp.csv | Currently planned production and production consistent with the scenario for each company and technology in the equity portfolio. |
| Forward-looking production/capacity data, aggregated to portfolio level | ++ Equity-PortInput-Port.csv | Currently planned production and production consistent with the scenario for each technology for the equity portfolio. |
| Forward-looking production/capacity data,  aggregated to company level | ++ Bonds-PortInput-Comp.csv | Currently planned production and production consistent with the scenario for each company and technology in the bond portfolio. |
| Forward-looking production/capacity data,  aggregated to portfolio level | ++ Bonds -PortInput-Port.csv | Currently planned production and production consistent with the scenario for each technology for the bond portfolio. |

## Data Dictionary

Describes the columns in the scenario analysis results files.

### Identifiers

These columns uniquely identify a row of results.

|  |  |  |  |
| --- | --- | --- | --- |
| **Column Name** | **Which asset**  **class does this**  **column apply to?** | **What aggregation level uses this**  **Column?** |  |
| Investor.Name | EQ, CB | Company, Portfolio | Investor Name |
| Portfolio.Name | EQ, CB | Company, Portfolio | Portfolio Name |
| Scenario | EQ, CB | Company, Portfolio | Identifies the scenario applied to calculate production “under the scenario”, which are saved in the  “.Scen” columns. IEA Scenarios currently included are the IEA’s: BDS, SDS, CPS, and NPS. |
| Allocation | EQ, CB | Company, Portfolio | Identifies the allocation method used for allocating some portion of the production of an entire company (pulled from ALD) to the company’s securities held in the portfolio. Possible values are:   1. PortfolioWeight. (used for EQ and CB) – production is allocated based on the weight (by Market Value) of the company’s securities in the portfolio. 2. Ownership. (EQ only) – production is allocated based on the share of a company owned by the portfolio (i.e., percent of free floating shares owned). |
| EquityMarket | EQ | Company, Portfolio | A grouping/filtering variable based on the country of domicile of the company issuing the securities. Based on its country of domicile, every company in the equity portfolio is mapped to one or more of the following EquityMarket values: Global, Developed, or EmergingMarkets.  For example, production from a company domiciled in the US would be included in both “Global” and “Developed” results. |
| Scenario  Geography | EQ, CB | Company, Portfolio | A grouping/filtering variable based on the country where production is located. Every country is mapped to one or more of the following regional ScenarioGeographies: Global, OECD, Non-OECD, North America, Europe, and Asia Pacific.  For example, production located in Japan would be included in “Global”, “OECD”, and “AsiaPacific” results. |
| Sector | EQ, CB | Company, Portfolio | Identifies the sector of production, based on the asset-level data. |
| Technology | EQ, CB | Company, Portfolio | Identifies the Technology used within a Sector to produce output, based on asset-level data. |
| Year | EQ, CB | Company, Portfolio | 2018-2023 |
| CorpBondTicker | CB | Company | Company identifier. For corporate bonds, this is the Bloomberg “COMPANY\_CORP\_TICKER” field. |
| bloomberg\_id | EQ | Company | Company identifier. For public equities, this is the Bloomberg “ID\_BB\_COMPANY” field. |
| Fin.Sector | EQ, CB | Company | The “Financial Sector” of the security based on standard sector classification schemes. This is a mapping from either the BICS\_SUBGROUP (corporate bonds) or ICB\_SUBSECOR (public equity) associated with a company to one of the sectors covered in the asset data (see “Sectors” row in this table for list of possible values).  If the BICS\_SUBGROUP or ICB\_SUBSECTOR is not one of the covered sectors, then this column may have a value of “Other” |
| Port.Wt | EQ, CB | Company | Weight in the portfolio (by market value) of the company’s securities. |
| Ownership.Wt | EQ | Company | Percent of the total shares of the company owned by this portfolio. |
| Allocation.Wt | EQ, CB | Company | Depending on the value in the “Allocation” field, either the value of **Port.Wt** or the value of **Ownership.Wt**. |

### Results

The results/metrics in these columns apply to the specific combination of values in the identifier columns (see previous table).

|  |  |  |  |
| --- | --- | --- | --- |
| **TECHNOLOGY RESULTS** | | | |
| **Plan.TechProd** | Technology production when all production from each company is allocated to the portfolio. | **Scen.TechProd** | Technology production consistent with the specified **Scenario**, when all production from each company is allocated to the portfolio. |
| **Plan.Alloc.WtTechProd** | Technology production allocated to the portfolio based on the either the weight of each company in the portfolio (PortWeight method) or the percent of the company that the portfolio owns (Ownership method).  This is equal to **Allocation.Wt** \* **Plan.TechProd** | **Scen.Alloc.WtTechProd** | Technology production consistent with the specified  **Scenario**, and allocated to the portfolio based on either the weight of each company in the portfolio (PortWeight method) or the percent of the company that the portfolio owns (Ownership method).  This is equal to **Allocation.Wt \* Scen.TechProd** |
| **Plan.Carsten** | Under the PortWeight allocation method, this is the percent of portfolio market value exposed production in the specified **Technology**.  Not calculated under the Ownership allocation method. | **Scen.Carsten** | Under PortWeight allocation method, this is the percent of portfolio market value exposed to production in the specified **Technology** consistent with the specified **Scenario.**  Not calculated under the Ownership allocation method. |
| **Plan.EmissionsFactor** | Emissions Factor in CO2/production units for each technology.  Only provided for cement, steel and aviation sectors. | **Scen.EmissionsFactor** | Emissions Factor consistent with the given **Scenario** in CO2/production units for each Technology.  Only provided for cement, steel and aviation sectors. |
| **Deviation** | Deviation of planned **Technology** production from **Technology** production consistent with the specified **Scenario**, expressed as a percentage  (**Plan.Alloc.WtTechProd** – **Scen.Alloc.WtTechProd**)/ **Scen.Alloc.Wt.TechProd** | | |
| **SECTOR RESULTS** | | | |
| **Plan.SecProd** | Sector production, if all production from each company was allocated to the portfolio.    This is the sum of **Plan.TechProd** for all technologies within the Sector. | **Scen.SecProd** | Sector production, if all production from each company consistent with the Scenario was allocated to the portfolio.  This is the sum of **Scen.TechProd** for all technologies within the Sector. |
| **Plan.Alloc.WtSecProd** | Sector production allocated to the portfolio based on the weight of each company in the portfolio (PortWeight method) or the percent of the company that the portfolio owns (Ownership method).  This is the sum of **Plan.AllocWtTechProd** for all technologies within the Sector. | **Scen.Alloc.WtSecProd** | Sector production consistent with the scenario allocated to the portfolio based on the weight of each company in the portfolio (PortWeight method) or the percent of the company that the portfolio owns (Ownership method).  This is the sum of **Scen.AllocWtTechProd** for all technologies within the Sector. |
| **Plan.Sec.Carsten** | Under PortWeight allocation method, this is the percent of portfolio market value exposed to the given Sector.  Not calculated under the Ownership allocation method.  This is the sum of **Plan.Carsten** for all technologies within the sector. | **Scen.Sec.Carsten** | Under PortWeight allocation method, this is the percent of portfolio market value exposed to the given Sector, if production is consistent with the given scenario.  Not calculated under the Ownership allocation method.  This is the sum of **Scen.Carsten** for all technologies within the sector. |
| **Plan.Sec.EmissionsFactor** | Emissions Factor in CO2/production units for the given sector.  This is the weighted average (by production) of  **Plan.EmissionsFactor** for all technologies within the sector.  Only provided for cement, steel and aviation sectors. | **Scen.Sec.EmissionsFactor** | Emissions Factor consistent with the given scenario in CO2/production units for the given sector.  This is the weighted average (by production) of  **Scen.EmissionsFactor** for all technologies within the sector.  Only provided for cement, steel and aviation sectors. |