How to Use Guide

Contents

1. Access

The ATI Market Model Online Tool can be accessed directly via the ATI Tools portal. New users can register a new account by following the instructions found in our *Registration Guidance* document. For existing users who have an active account, you can sign in directly with your Market Model Online Tool credentials.

The ATI Market Model Online Tool can be accessed via a computer or most handheld devices with connection to the internet.

2. Acronyms and Terms

PBS – Product Breakdown Structure
ZC – Zero Carbon
UE – Ultra-Efficient
FC – Fuel Cell
EIS – Entry Into Service
MEA – More Electric Aircraft

Market Class – Categorisation groups of aircraft based on the aircraft range and aircraft size (passenger seat capacity) as described in the table below.

Group	Max Range	Seat Capacity	Examples
Widebody Jets	> 5,250 nmi	> 300	A350, A380, B777, B787
Midsize Jets	3,000 nmi - 5,250 nmi	200 - 300	A330, A340, B757, B767
Narrowbody Jets	2,000 nmi - 3,000 nmi	120 - 220	A320, B737, A220
Regional Jets	1,200 nmi – 2,000 nmi	50 - 120	E Jet (E170/E190), Bombardier CRJ
Regional Turboprops	< 1,200 nmi	20-80	Dash 8, ATR 72

Product Breakdown Structure (PBS) – This is the breakdown of systems into subsystems and components based on the aircraft type and adopted technology. The breakdown in the ATI Market Model Online Tool ranges from Level 1 – Level 3.

PBS Class – Categorisation of aircraft based on aircraft type and aircraft technology classification (e.g. Zero Carbon Emissions (ZC), Ultra-Efficient (UE), More Electric Aircraft (MEA) or Conventional). Below is a description of the current PBS Classes used in the ATI Market Model Online Tool:

- Conventional – Jet and turboprop engine aircraft with current technology adopted
- Ultra-Efficient – Next generation jet and turboprop aircraft with improved energy efficiency technology adoption e.g., composite wings, more-electric aircraft systems, ultra-efficient propulsion
- More Electric Aircraft – Aircraft primarily adopting more-electric non-propulsive systems
- Zero Carbon Emission – Zero carbon emission aircraft comprising Fully Electric, Hydrogen Fuel Cell and Hydrogen Combustion

NOTE: The current version of the Market Model Online Tool data does not address the Hybrid classification of aircraft.

3. Using the ATI Market Model Online Tool

The ATI Market Model Online Tool is a platform that graphically summarises global commercial aerospace market data based on ATI market and economic scenarios, classification filters and / or technology-based product breakdown classifications. The core data is externally evaluated via the ATI Market Model and relevant outputs are compiled and summarised in the ATI Market Model Online Tool. Below is a description of the different elements of the landing page to aid the user navigate and use the ATI Market Model Online Tool.

NOTE: The data used to generate the plots and terms presented here are for the purpose of this how to use guide and may differ from those used in the live version of ATI Market Model Online Tool. Please refer to the Market Model Online Tool Scenarios Guide for updated descriptions of market and economic scenarios and aircraft classifications.

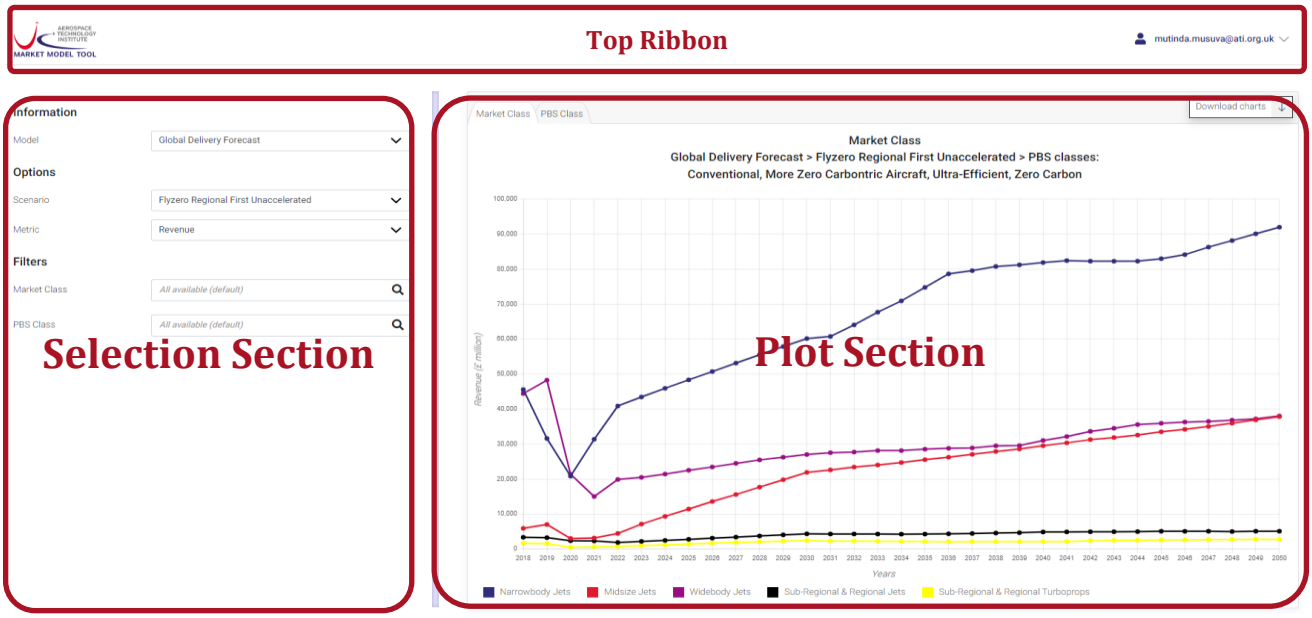
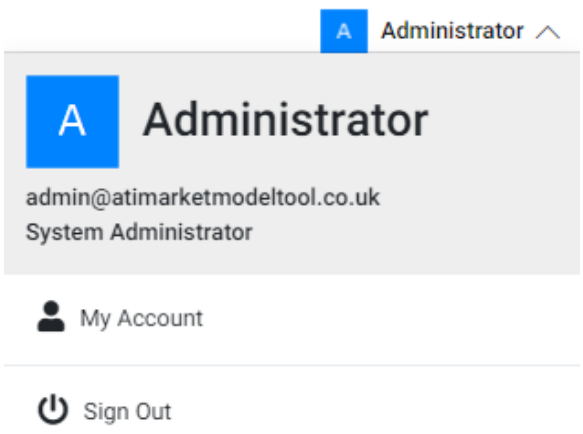


Figure 1: ATI Market Model Online Tool Landing Page.

Top Ribbon

This section is located at the top of the landing page as illustrated in Figure 1. It contains the ATI Market Model Online Tool logo button (left), and the user account details and options (right).

AEROSPACE TECHNOLOGY INSTITUTE MARKET MODEL TOOL	ATI Market Model Online Tool logo - This button refreshes the page and resets all filters and options previously selected.



User Account details – Contains the active user account email. When clicked, a drop-down menu appears containing:

- User email and organisation details.
- Change Password option – When this option is selected, you will be redirected to a page and prompted to enter your current password and new password (you will also be required to confirm your new password). The new password does not have any specific requirements (e.g., uppercase, number, symbol, minimum number of characters) but has an algorithm that evaluates the strength of your password. Your password will not be changed unless your new password is classified as *Good* or *Strong* and both the initial and confirmation new passwords match.
- Sign Out option – This will sign you out of the ATI Market Model Online Tool and you will be redirected to the sign in / registration page of the tool.

Selection Section

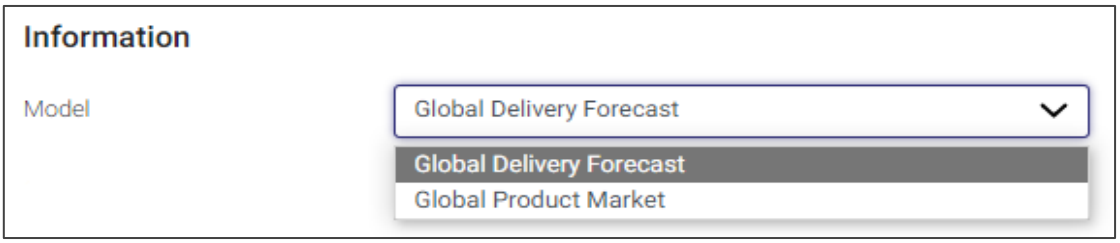
The selection section is located on the left side of the landing page as indicated in Figure 1. It contains the *Information*, *Options* and *Filters* sections which allows the user to make a combination of selections, via dropdown menus and textboxes, to obtain a summary of relevant global commercial aerospace market data.

Information

The drop-down menu in the *Information* option allows the user to select the type of market forecast outputs. Currently, the ATI Market Model Online Tool data comprises the *Global Delivery Forecast* and the *Global Product Market* data derived from the ATI Market Model.

- The *Global Delivery Forecast* represents the annual trend for global new deliveries and the market forecast is given in either revenue (£m) or units. How to use, manipulate and filter this data is described in section 4.2.
- The *Global Product Market* represents the annual trend for global commercial aircraft systems and components (products) and is presented only in revenue (£m). The system and component definitions are based on aircraft types and technology groupings, leading

to the classification of the aircraft into Product Breakdown Structure (PBS) classes. How to use, manipulate and filter this data is described in sections 3.1 and 3.2.



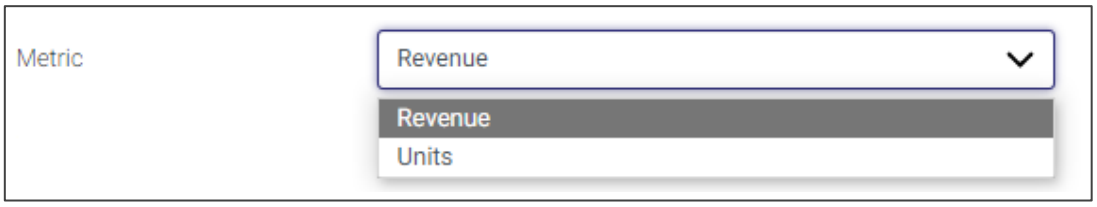
Based on the user selection in the Information section, the *Options*, *Filters* and tabs on the plot sections will automatically change accordingly to provide the user with relevant selections relating to each type of market forecast output. The selection and plot sections from Figure 1 will be discussed for each of the forecasts selected.

3.1. Global Delivery Forecast

Options

The *Options* section for the *Global Delivery Forecast* selection comprises the *Scenario* and the *Metric* categories. The *Scenario* option contains a drop-down list of the market and economic scenarios which vary mainly based on aircraft development and Entry Into Service (EIS) dates, demand and new aircraft penetration rates. The user can select the desired scenario from a drop-down list and only one scenario can be active at a given time. Please refer to the Market Model Online Tool *Scenarios Guide* document for more information and descriptions current market and economic scenarios.

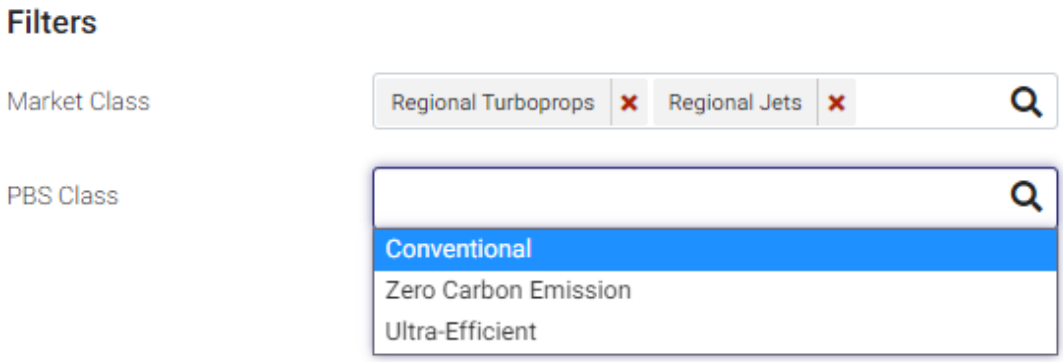
The *Global Delivery Forecast* data is presented in Units (number of new deliveries) or Revenue (£m). The user can make this selection from the metric drop-down list.



NOTE: The market and economic scenarios may be periodically updated by the ATI.

Filters

Generally, the *Filters* section allows the user to select multiple items from a drop-down list. By default, the selection text boxes are empty. When the text box is clicked, the user can select items from the drop-down list or alternatively use the text box to search for specific selections (which can be beneficial when dealing with a long list of selections). As the user types, the drop-down list will dynamically adjust and show matching items. Unwanted active selections can be removed by clicking on the red cross that is located on the right-hand side of the item.



The filter options relating to the *Global Delivery Forecast* market output include *Market Class* and *PBS Class*. These two aircraft classifications are interdependent. Therefore, selecting items in one classification group may in some cases impact available items in the other. For instance, if the Regional Turboprops and Regional Jets *Market Class* categories are selected, only the *PBS Class* options related to these market grouping will be available (in this case More Electric Aircraft will not be included in the *PBS Class* dropdown as it does not apply to Turboprops or Regional Jets). By further selecting the Conventional *PBS class*, the displayed data will only contain the market value for Conventional Regional Turboprops and Regional Jets.

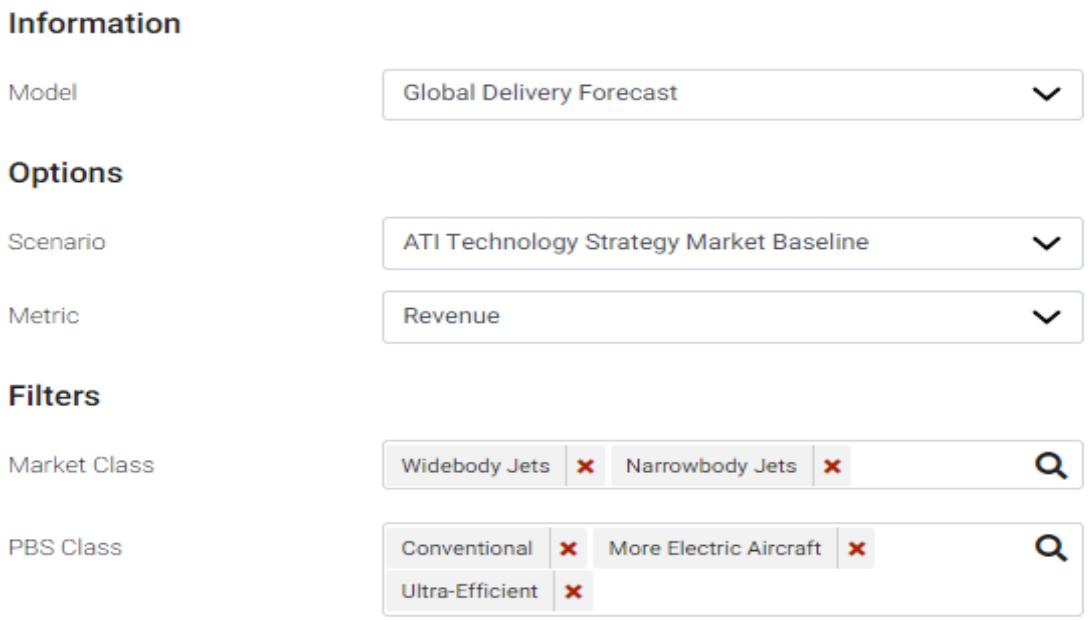
NOTE: The PBS Class and Market Class categories may vary or be updated according to the market and economic scenarios in use. Please refer to the Market Model Online Tool Scenarios Guide document for more information.

Plot Section

The ATI Market Model Online Tool summarised graphical outputs are contained in the plot section on the right side of the landing page as indicated in Figure 1. The plots are generated based on the user's selections and filters. Multiple tabs located on the top left allow the user to view a variety of plots based on the market forecast output selected. The graph heading is located above the plot and primarily shows the type of data output, the market forecast selected, the active scenario, and in some cases, the groupings (*Market Class* or *PBS Class* groupings selected).

The legend is positioned at the bottom of the graph. If there is an overspill, the user can click the button on the right of the legend (as highlighted in the figure above) and an extended legend describing all relevant data series is generated on the left of the graph.

TIPS: The user can obtain a full description of the output plot by hovering the cursor over the heading.
Hovering the cursor on the horizontal axis label provides the user with a full description of the horizontal axis measurements.
The user can deselect and reselect data series by clicking on the relevant item on the legend. Deselected data series will be indicated with a line crossing over the relevant item (as illustrated for Exhaust in the figure above).



When the *Global Delivery Forecast* market option is selected, there are two available tabs to view the market forecast outputs; by *Market Class* and *PBS Class*. Given that the *Market Class* and *PBS Class* filters are interdependent, the data outputs will only take into account the filter items selected.

For example, if the user wants to compare the global market revenue forecast for *Conventional, More Electric Aircraft* and *Ultra-Efficient Narrowbody Jets* and *Widebody Jets*, the user should select *Narrowbody Jets* and *Widebody Jets* in the *Market Class* and *Conventional, More Electric Aircraft* and *Ultra Efficient* in the *PBS Class* filter sections. The data series will not contain the values of other *PBS Classes* (for example, *Zero Carbon Emission*).

The *Market Class* tab, as illustrated in Figure 2, will generate the *Narrowbody Jets* and *Widebody Jets* global revenue for *Conventional, More Electric Aircraft* and *Ultra Efficient* new aircraft deliveries. Similarly, the *PBS Class* tab as illustrated in Figure 3, will generate the *Conventional, More Electric Aircraft* and *Ultra Efficient* global revenue for only *Narrowbody Jets* and *Widebody Jets* new aircraft deliveries.

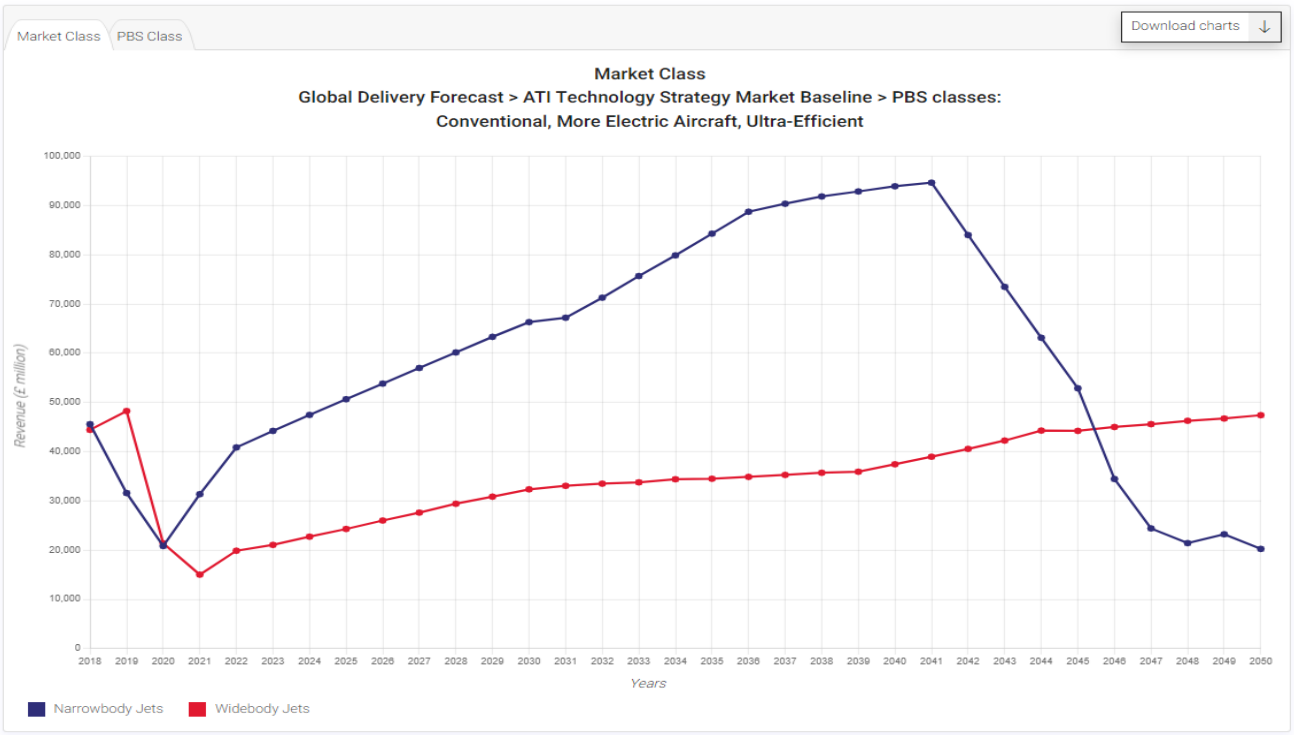


Figure 2: Global Delivery Forecast by Market Class.

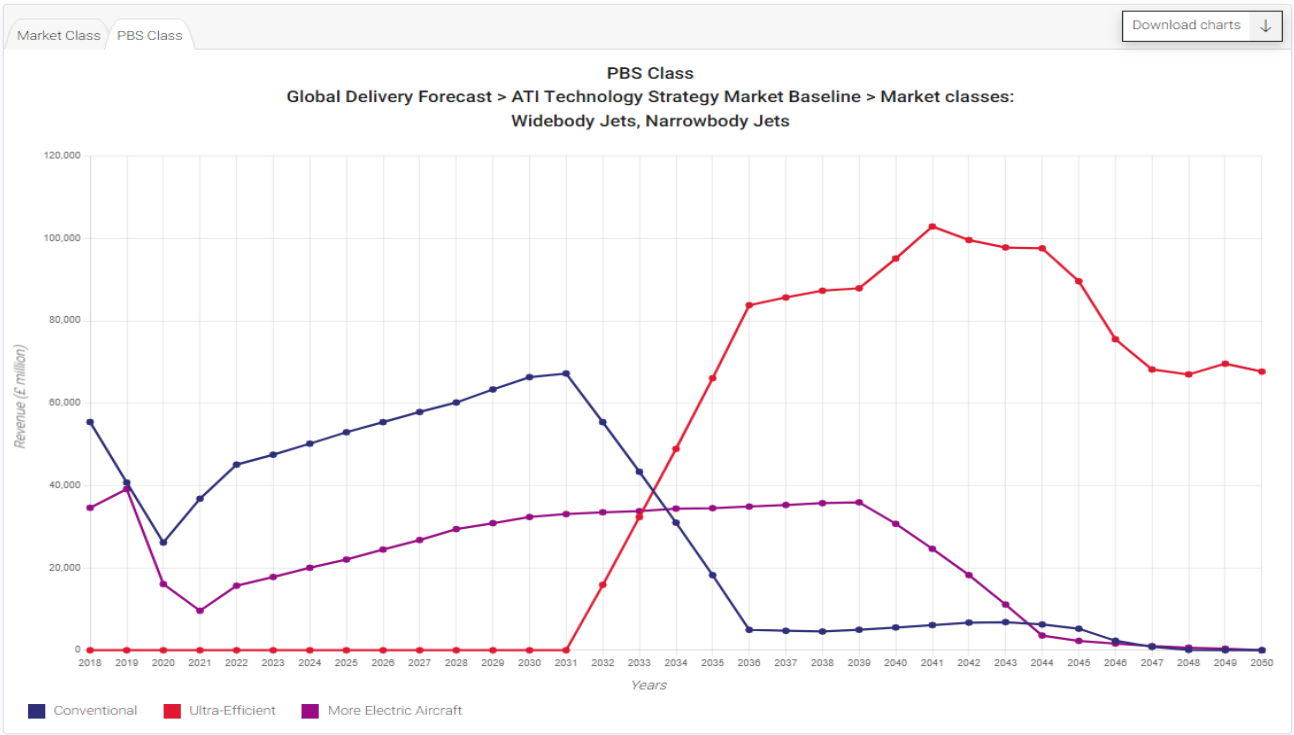
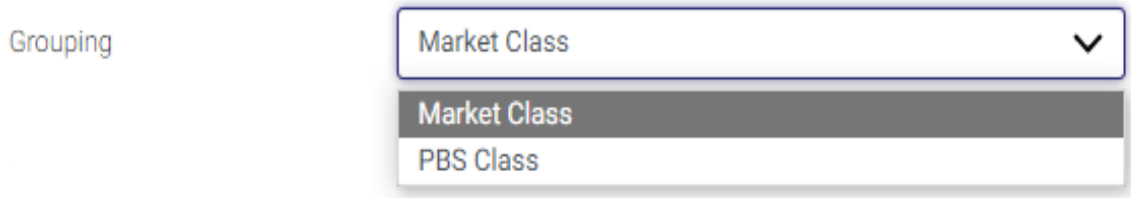


Figure 3: Global Delivery Forecast by PBS Class.

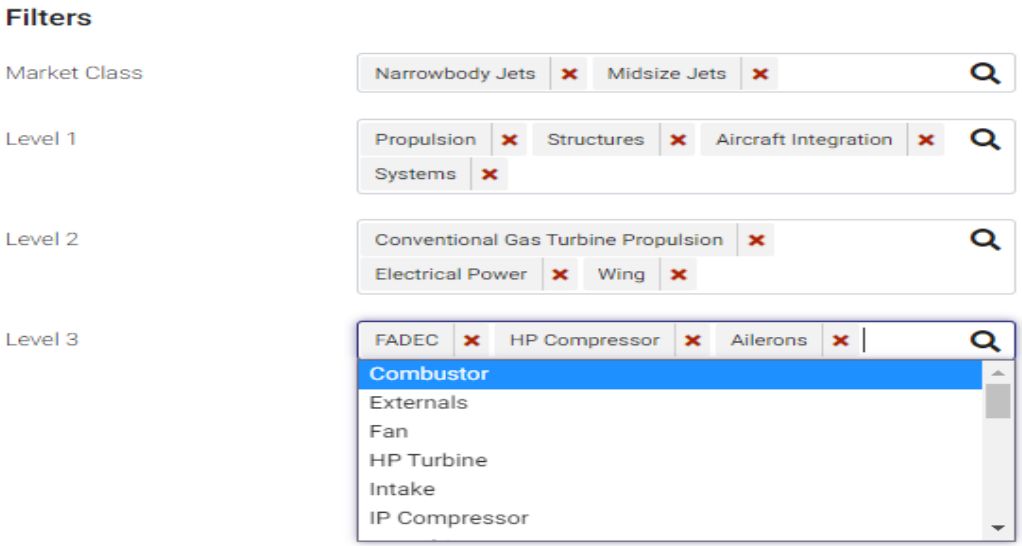
3.2. Global Delivery Forecast

Options

The *Scenario* option for the *Global Product Market* is the same as discussed in Section 3.1. However, there is no *Metric* option as the *Global Product Market* data is only represented in terms of Revenue. Instead, there is an aircraft *Grouping* option from which the user can either select the *Market Class* or *PBS Class* groupings from the drop-down list. This will determine the corresponding filter options available.



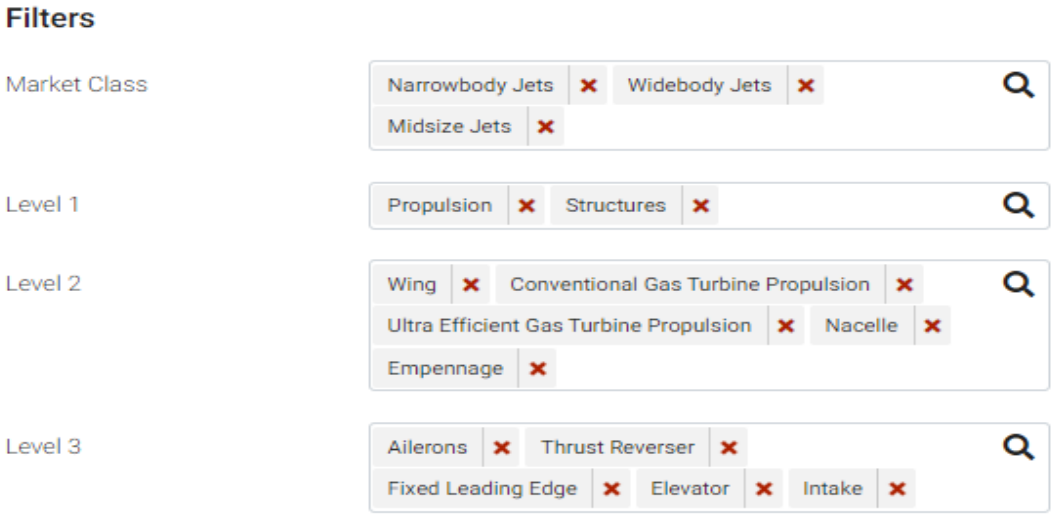
The *Filters* options relating to the *Global Product Market* output include the *Market Class / PBS Class* (depending on which grouping the user has selected in the *Options* section), *Level 1*, *Level 2* and *Level 3* filters. The levels correspond to the *Product Breakdown Structure* definitions for grouped aircraft systems and components categories. By default, the *filters* text boxes are empty. The available selections in the level filters correspond to the *Market Class / PBS Class* selected groups. For example, selecting the Conventional *PBS Class* will result in products only relating to the conventional class of aircraft being available for selection at the different subsequent levels. Furthermore, the available selections in the levels are dynamic. The selected items in *Level 1* will impact the available selections in the *Level 2* drop-down list and subsequently *Level 3.* For example, in the diagram below, the *Level 3* drop-down list will only contain components related to *Conventional Gas Turbine Propulsion*, *Wing* and *Electrical Power Systems* selected in *Level 2*. Deselecting an item in *Level 1* will automatically lead to the removal of all related subsystems and components selected in *Level 2* and *Level 3*.



NOTE: The Product Breakdown Structure systems and components may vary or be updated according to the PBS Class categories and/or definitions in use.

Plot Section

There are 5 available tabs when generating the market forecast data by *Global Product Market* and these include: *Market Class / PBS Class* (depending on which grouping is selected in the *Options* section), *Totals*, *Level 1*, *Level 2* and *Level* 3.



If the user, for example, makes the *Options* and *Filters* selections, as illustrated in the diagram above, the resultant global market revenue graphical output in the *Level 3* tab will contain the *Ailerons* (Wing), *Thrust Reverser* (Nacelle), *Intake* (Conventional & Ultra-Efficient Gas Turbine Propulsion), *Elevator* (Empennage) and *Fixed Leading Edge* (Wing) data for *Narrowbody Jets, Midsize Jets* and *Widebody Jets* only (as illustrated in Figure 4).

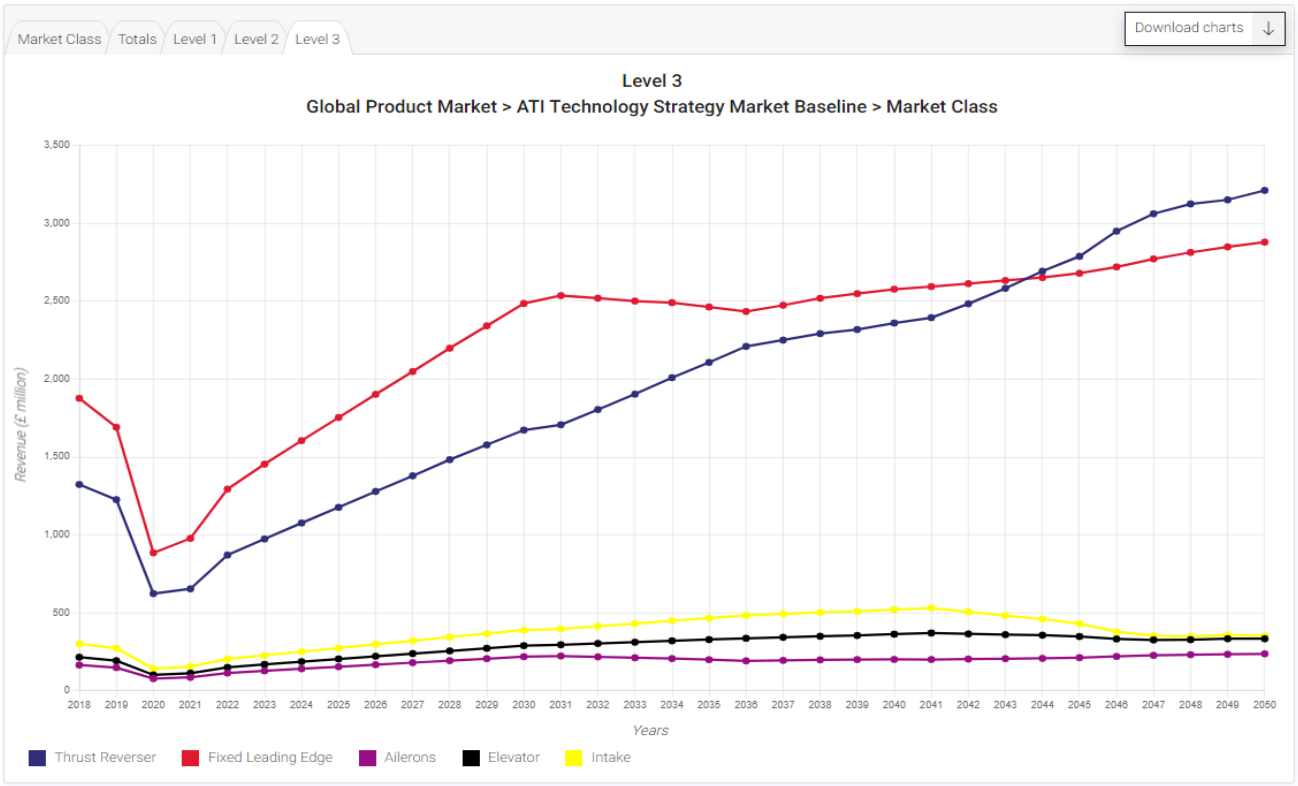


Figure 4: Global Product Market by Market Class – Level 3.

Figure 5 shows the level 2 related products i.e., Wing (Structures), Conventional & Ultra-Efficient Gas Turbine Propulsion (Propulsion), Empennage (Structures) and Nacelle (Structures) for Narrowbo*dy, Midsize* and *Widebody Jets* total global market revenue for the selected items in *Level 3*.

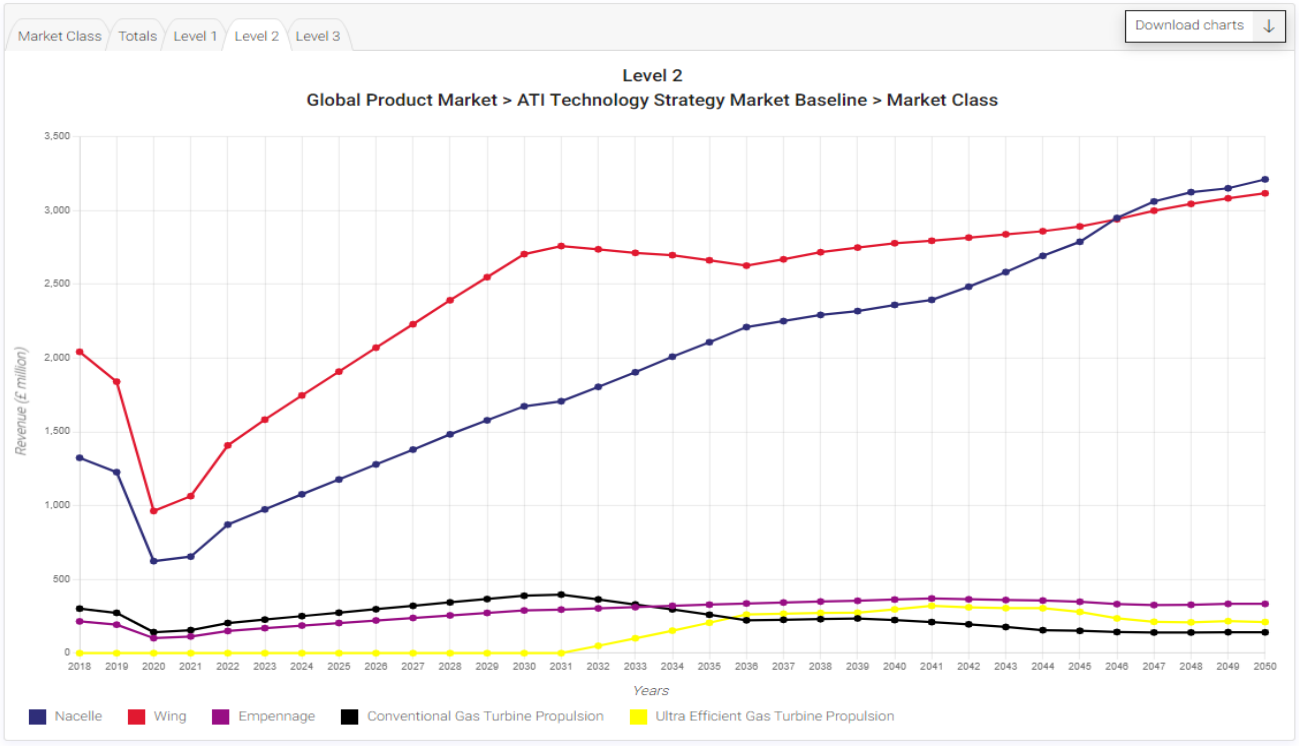


Figure 5: Global Product Market by Market Class – Level 2.

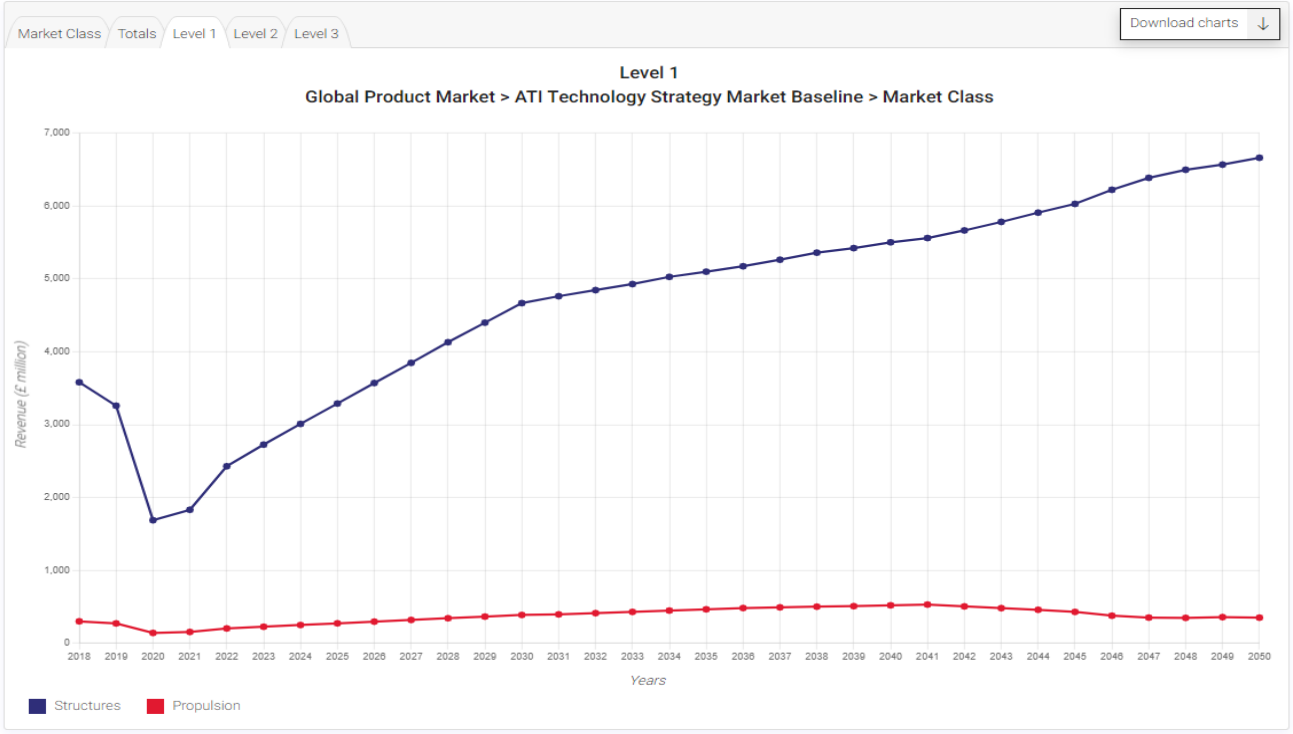


Figure 6: Global Product Market by Market Class – Level 1.

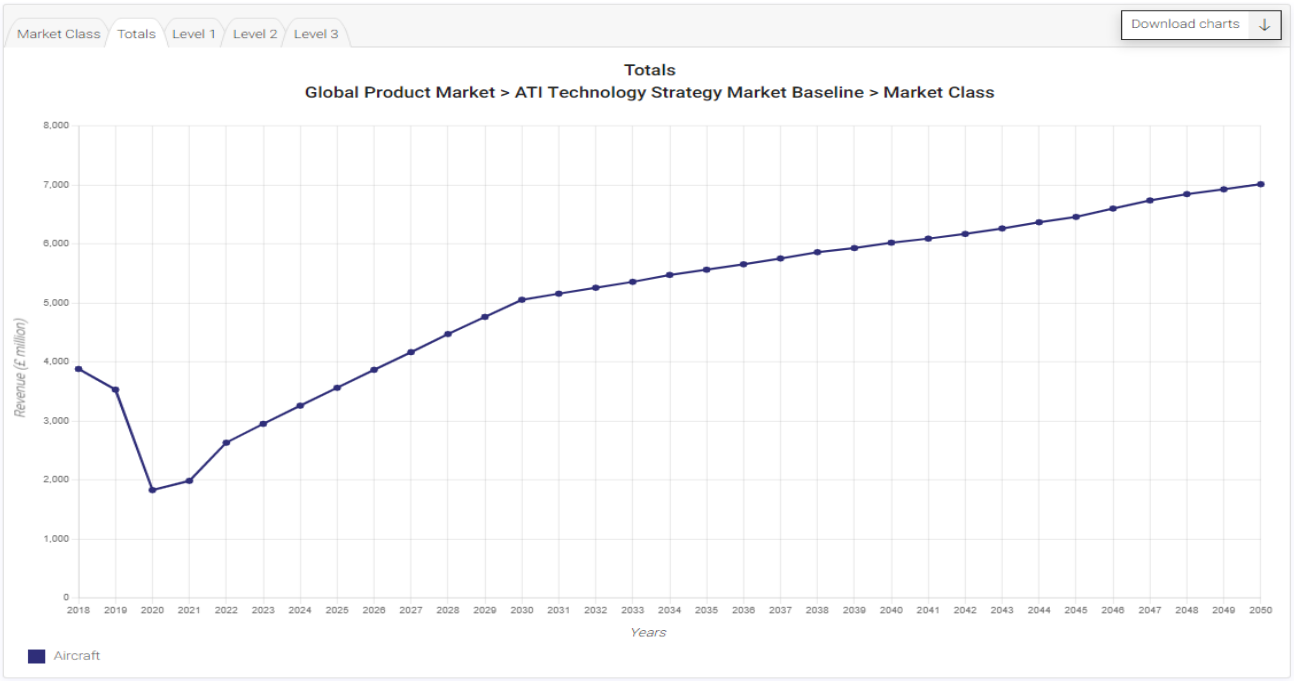


Figure 7: Global Product Market by Market Class - Total.

Subsequently, at *Level 1* the resultant output, as illustrated in Figure 6, comprises of only *Propulsion* (Conventional & Ultra-Efficient Gas Turbine Propulsion) and *Structures* (Wing, Empennage and Nacelle) from selections made in *Level 2* and *Level 3*.

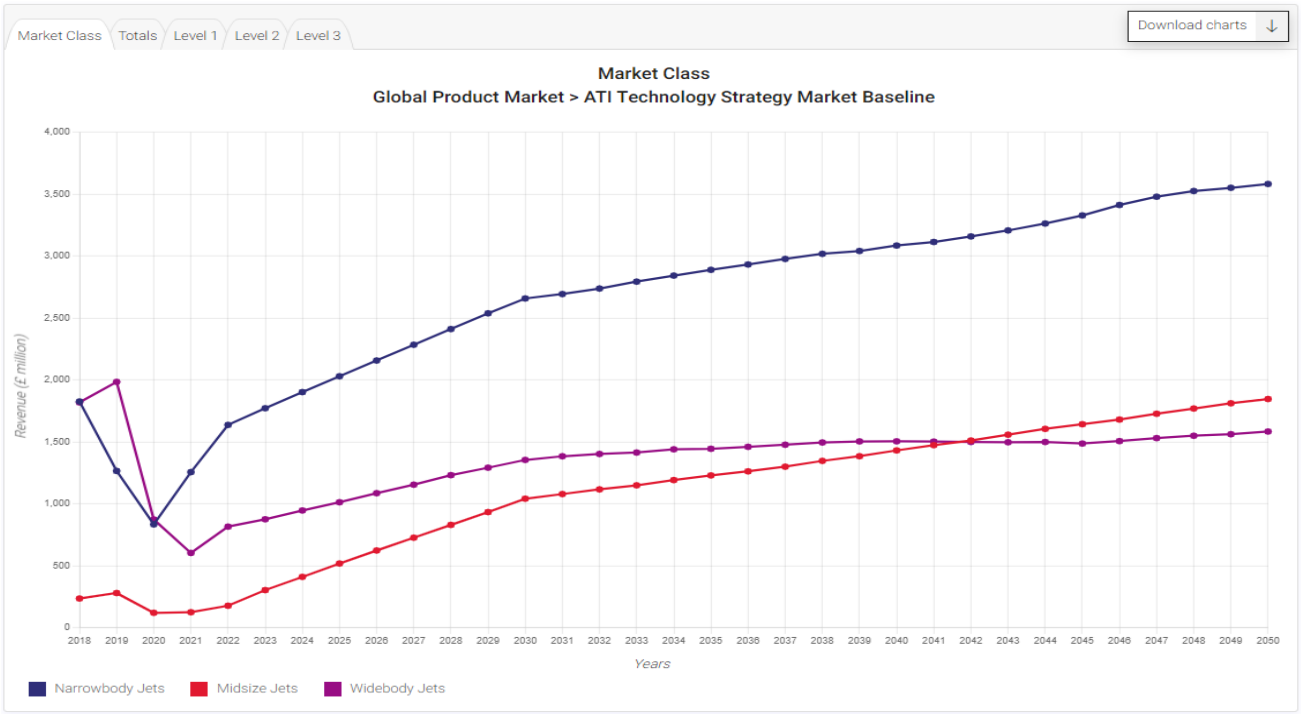


Figure 8: Global Product Market by Market Class.

The *Totals* tab generates the total output graphs based on the filter selections made in the groupings (*Market Class* or *PBS Class*) and levels textboxes. Therefore, the global product revenue plot in Figure 7 is the combined total of *Narrowbody*, *Midsize* and *Widebody Jets* based on the items selected in *Level 1, Level 2* and *Level 3*. Figure 8 shows the *Market Class* tab plot

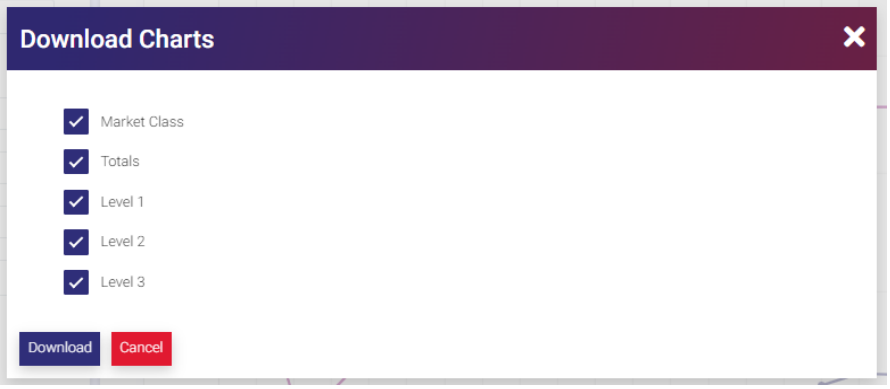
output, where a comparison of the *Narrowbody, Midsize* and *Widebody Jets* total global revenue for the selections made in the *Filters* section.

NOTE: If the user opts to only apply filters at Level 1 and Level 2, leaving Level 3 blank, the Level 3 plot tab will generate the data series for ALL applicable components that fall under the filter selections made at Level 2.

In the previous example, if you were to additionally select Systems in the Level 1 filter box without selecting any subsequent subsystems or components, the graph plots at Level 1, Level 2 and Level 3 will not include the Systems data series. When selecting filter items in preceding levels, please ensure you select all the relevant filter items in the levels that follow (ensure all subsystem and/or component breakdowns are defined to the same level) as the related data will be omitted from the analysis if other component breakdowns carry on to the next levels.

Downloading Charts

The user can download the relevant data graphs by clicking the *Download Charts* button located at the top right of the plot section. A menu window will automatically appear (diagram on the left), and the user can select the graphs (linked to the tabs) they wish to download. After clicking download, a folder containing the *.PNG graph files will be created in the browser downloads default location. Attached to the output graph files is a filter summary *.txt file containing the description of the downloaded charts, including the *Options* and *Filters* selected.



Further Help

If you would like more information or more detailed description on the Market and Economic Scenarios currently used in the ATI Market Model Online Tool, please refer to our *Scenarios Guide*.

For more information or if you are experiencing difficulties using the ATI Market Model Online Tool, please contact us and a member of our team will be in touch.