The state of Commercial Earth Observation

Size & Growth across ESA Member States

Methodology and detailed findings

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LE London Economics

About London Economics

- London Economics (LE) is one of Europe's leading specialist economics and policy consultancies, with a dedicated team of economists specialised in the space sector.

- As a firm, our reputation for independent analysis and client-driven problem solving has been built up over 30 years. From our headquarters in London, and associate offices in five other European capitals, we advise an international client base.

- The London Economics Space Team have been pioneering innovative analytical techniques and advising decision-makers in the space industry across more than 100 projects since 2008.

- Across the full space value chain and all types of satellites, we advise national governments, space agencies, private and third sector organisations on space policy, economics and market analysis. We offer expertise in market sizing and forecasting, strategic insight, business cases, due diligence, and return-on-investment analysis from launch to applications and across GNSS, EO, Satcom and Science.

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Contents

Executive summary

- **London Economics** was commissioned by the **European Space Agency** (ESA) to quantify the **size of the Earth Observation (EO) market** and **size of the NewSpace EO market** in ESA Member States and Slovenia.

- This will allow ESA to track **industry growth** and the **emergence of new entrants** across the EO and NewSpace EO value chains at a national level. It will also allow Member States to make informed decisions about **national investments** in EO and NewSpace and support the case for EO more generally.

- London Economics conducted a **bottom-up organisation level analysis**. This involved cataloguing and assessing EO companies in each member state, retrieving financial and employment information from 2013 to 2018 for each company, and aggregating the results. These results are elaborated in this document and cover over **800 companies**.

- The study focuses on the **commercial** EO turnover and employment, within **22 ESA Member States + Slovenia**.

- Overall, the aggregate size of the EO market in these 23 countries in 2018 was **€3,300 million.** This turnover supported a total of **16,200 employees** (full time equivalent).

- Of this, the NewSpace EO market in 2018 accounted for **€1,000 million** in turnover and employed **6,300 individuals** (full time equivalent). Definitions as well as results of the market assessments for the EO and NewSpace EO markets are presented separately on the subsequent pages.

Methodology

Definitions and scope

- **Earth Observation** – satellite-derived remote-sensing.
- **Organisation** – commercial organisations only.
- **Geographical scope** – ESA's 22 full member states and Slovenia.
- **Time scope** – from 2013 to 2018.
- All figures are presented in **2018 prices**.

Methodology: elaborated in later slides

Identification

- ESA lists of funded organisations
- Lists of grantees of EU Framework Programmes (in ESA Member States)
- National space/EO catalogues (received from AT, CZ, DE, DK, EL, ES, FI, HU, IE, IT, LU, NL, PL, PT, SE, UK)
- ESA Member States delegates comments (received from CZ, EE, DE, EL, LU, and SI by early July 2019)

Assessment

- Analysis of publicly available information on each organisation (e.g. website, annual report, presentation, catalogue entry). Only commercial organisations in scope.
- Determine key shares of company turnover, based on public data (e.g. annual report or no. of products meeting conditions): **EO** and **Value Chain Segment**
- Determine binary parameters: **ESA Member State** (for organisations with subsidiaries in many states, each subsidiary represents its home state); **application area** (the parameter shows whether the organisation is active, but not its share of turnover)

Financial data

- Extraction of turnover and employment data from financial databases, annual reports and catalogues
- Estimation of turnover and employment data for companies below the statutory reporting threshold using historical data

Analysis

- Compilation of **assessment data** (EO, value chain, application area) and **financial data** (turnover, employment) for each organisation.
- Estimation of findings for each organisation: EO turnover; EO employment.
- Aggregation of results to Member State and ESA levels: total EO turnover; total EO employment.

Caveats and limitations (1/2)

- This **bottom-up** market assessment relies on **secondary research** of public domain documents and therefore LE's **subjective assessment** of organisation-level parameters, without validation against primary research. LE's experience, expertise, approach and internal validation with ESA mitigates some of these risks. However, inaccuracies for individual organisations may exist, especially since some companies are not obliged to report the data we need in their financial accounts or websites (e.g. EO-share of turnover etc.).

- To provide comprehensive coverage of the market, LE identified thousands of organisations across the 22 Member States and Slovenia using a variety of source lists. This includes organisations from several ESA databases of companies and supplemented by a dedicated programme of LE research at the Member State level and inputs from Member State delegates. From this, over 800 unique organisations where identified as 'EO-relevant'. This study accepts the inevitability of omissions.

- This study is '**historically-blinkered**': while it presents a robust estimate of the size of the EO market in 2018, estimates of the EO market's evolution since 2013 are retrospective:
  1. Most companies only present up-to-date information on their websites. Historical breakdowns of their activity are not available and have to be approximated by current activity. On average, it is assumed that EO share of companies is more likely to have increased than decreased. This would imply the historical figures are **over**estimated as a result.
  2. Market attrition (exit from the industry) cannot be identified with any certainty, so the retroactive market assessments between 2013 and 2017 are indicative. It is assumed that attrition from the EO market would imply the historical figures are **under**estimated as a result.

Caveats and limitations (2/2)

These countervailing effects mean it is not possible to determine the direction of bias in the historical estimates.

- While non-satellite remote sensing (e.g. via drones and aerial photography) is outside the scope of the study, most EO application providers are technologically 'agnostic' about the source of EO data. Where companies use satellite inputs, but do not specify the proportion compared to non-satellite EO inputs, LE assumed that satellite inputs are fully relevant to the company/product. This assumption is consequential to the results and will impact any future iterations of this study.

- Financial information is not available for organisations with incomes below the statutory reporting thresholds for published annual accounts. For these organisations, LE had to adopt an empirically-based estimation approach. Specifically, LE's historical analysis of UK and Danish survey data of space companies suggest that the average turnover of companies below the statutory reporting threshold are **26% of this threshold.** Most companies in this analysis provide financial information so this empirically-based estimation was applied to only a small proportion of all firms in this analysis. However, Austria, Denmark, Luxembourg, and Poland have a large proportion of firms below the reporting threshold. This empirically-based estimation therefore accounts for a large proportion of the turnover estimates in these countries.

- For those companies where no financial information is available, turnover is assumed to remain constant in real terms (2018 prices) between 2013 and 2018. In other words, it is assumed that nominal growth of turnover is offset by the rate of inflation.

Methodology: overview

Four-stage approach – elaborated in subsequent slides

Step 1: Definitions and analytical framework

- Establish the parameters of the study
- Define EO relevance
- Define NewSpace relevance

Step 2: Identification

- Identification of EO organisations in ESA Member States based on:
  - ESA databases
  - LE databases and research
  - ESA MS delegate inputs

Step 3: Assessment of EO organisations

- Bottom-up assessment of each EO organisation to determine key parameters
- Matching with financial data (provided or estimated)
- Internal validation of EO assessments with ESA

Step 4: EO market share estimation

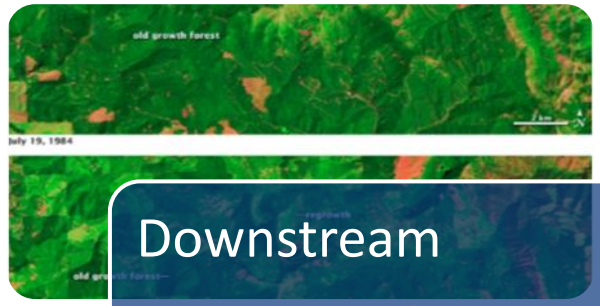
- Aggregation and analysis of data

Step 1: Definitions & Analytical Framework (1/3)

- Notable parameters/ definitions:
  - **Earth Observation** – satellite-derived remote-sensing.
  - **Organisation** – commercial (revenue-generating) organisations only.
  - **Geographical scope** – ESA's 22 full members and Slovenia. Canada is beyond the scope of the study.
  - **Time scope** – from 2013 to 2018.
  - **Value chain:**

Upstream
- Platform
- Payload

Midstream
- Data acquisition
- Data storage/distribution



Downstream
- Data processing
- Analysis and insight

Step 2: Identification

- LE created a **master list of EO organisations**, compiling data from a range of sources, including:
  - ESA's core databases;
  - ESA's procurement lists;
  - Lists of organisations involved in ESA Framework Programmes (e.g. Horizon 2020);
  - Country-specific and European space/EO catalogues (at the Member State level);
  - Lists submitted by ESA Member State delegates (requests for inputs were sent to all delegates)
  - Previous LE studies (e.g. Size & Health of the UK Space Industry 2018; Analyse- og evidensgrundlag for rumområdet i Danmark)
  - Dedicated programme of desk-based research of company lists in each Member State (membership organisations, product lists, conference lists, business catalogues, etc.)

- These lists were reviewed by the ESA project team and any omissions where identified.

Step 3: Assessment of EO activities

- Companies on this list were assessed for the share of turnover derived from EO activity (EO share of turnover) through the following estimation methods:

Method 1: EO share directly provided	Some of the larger or more EO-intensive organisations provided a direct estimate of their total turnover that is EO relevant in the financial accounts.
Method 2: divisional share	Some organisations that do not provide an EO-specific share directly may provide a detailed breakdown of their business activities by division, which could in turn be broken-down further into product groups.
Method 3: product method	Where organisations do not provide enough information to adopt any of the methods described above, LE reviewed product lists and catalogues and assumed that EO share is equivalent to the proportion of these products that could be identified as being EO relevant.

- The **segment of the value chain** that the company operates in was designated based on their products.
- **Applications** of relevance was assessed through review of product and website information.

Step 4: Analysis and aggregation

- Each relevant organisation was identified in **Bureau van Dijk's Orbis database** of registered companies, giving the year of incorporation and status, as well as financial and employment data on organisations above the statutory reporting threshold for annual accounts (€12m turnover) and smaller companies that choose to report.

- Missing information at the company level was added based on assumptions including:
  - Turnover in year before incorporation is €0 and growth from that year to first year of observed data is linear;
  - Missing turnover in years between observed values evolve linearly;
  - When data is missing, growth rates of turnover and employment are similar; and
  - Average turnover per employee for companies in the same country and value chain segment are the same.

- Organisations below the statutory reporting threshold for annual accounts may choose not to provide data on turnover or employment publicly. For these organisations, LE had to estimate their turnover by using empirically-based rules. Analysis from LE's previous studies on the Danish space industry and *Size and Health of the UK Space Industry 2018* suggest that these small companies turnover **26% of the EU reporting threshold on average**. This empirical rule is adopted for the minority of firms that do not report financial information in this study.

- For large companies, retrospective analysis was undertaken to explain large variations in turnover year-on-year, including those arising from sales of (non-EO) business units.

- Finally, LE calculated the size of **the EO market in aggregate** and **across Member States** over time.

Summary of commercial EO market assessment (Europe)

- Turnover (2018 prices)
- Employment (full time equivalent)
- Market share
- Leading companies
- Summary

Headline finding on size and growth of EO in 2018 (Europe)

In 2018, the industry generated:

A turnover of €3,300m

+1.7% CAGR p.a. since 2013

- +1.0% p.a. in the upstream
- -1.6% p.a. in the midstream
- +4.3% p.a. in the downstream

Companies are most active in:

Agriculture

Oceanography

Environment

In 2018, the EO market had:

805 registered companies

16,200 people employed (FTE)

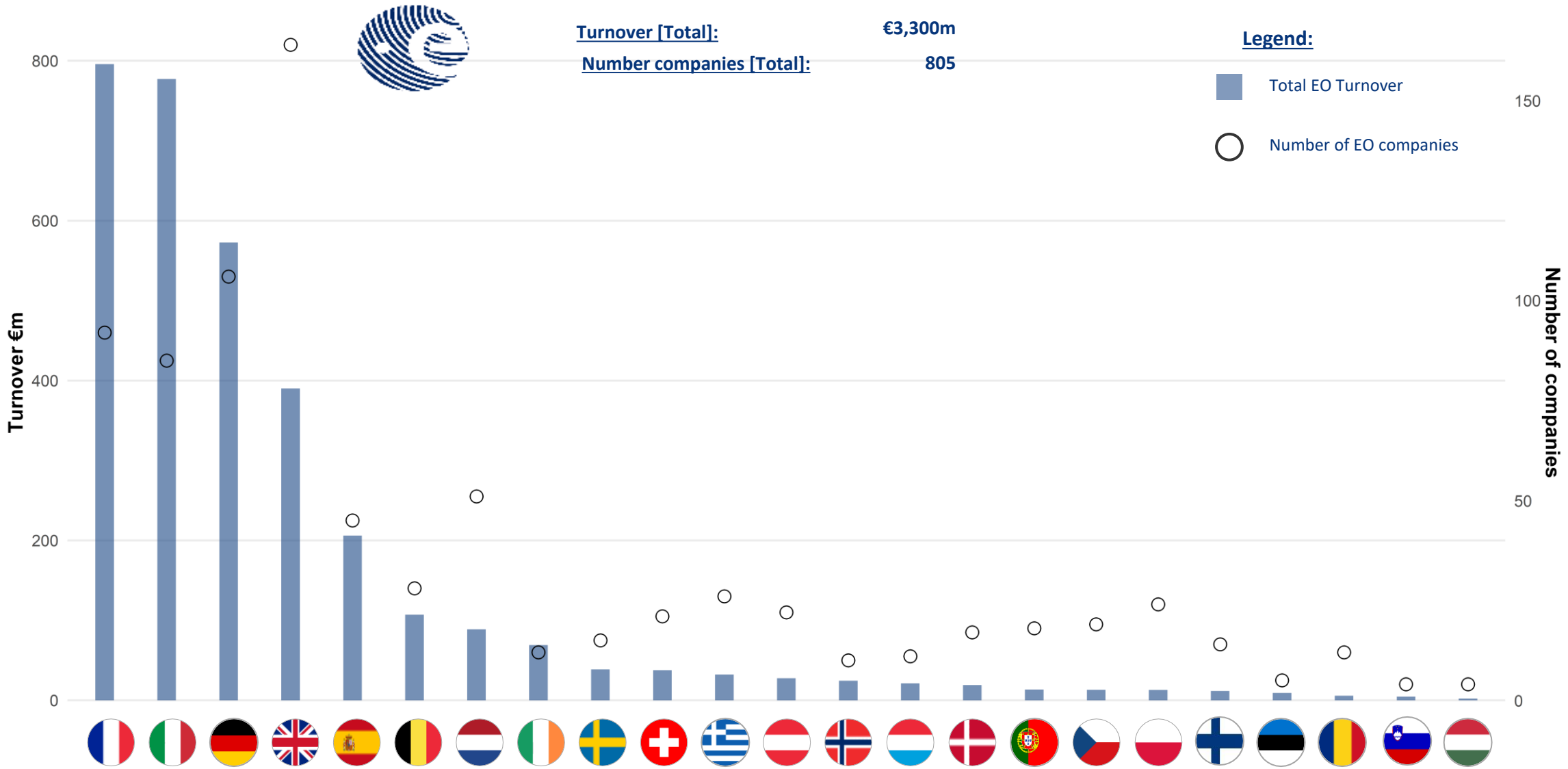
The top 3 companies by EO turnover are:

Thales Alenia Space

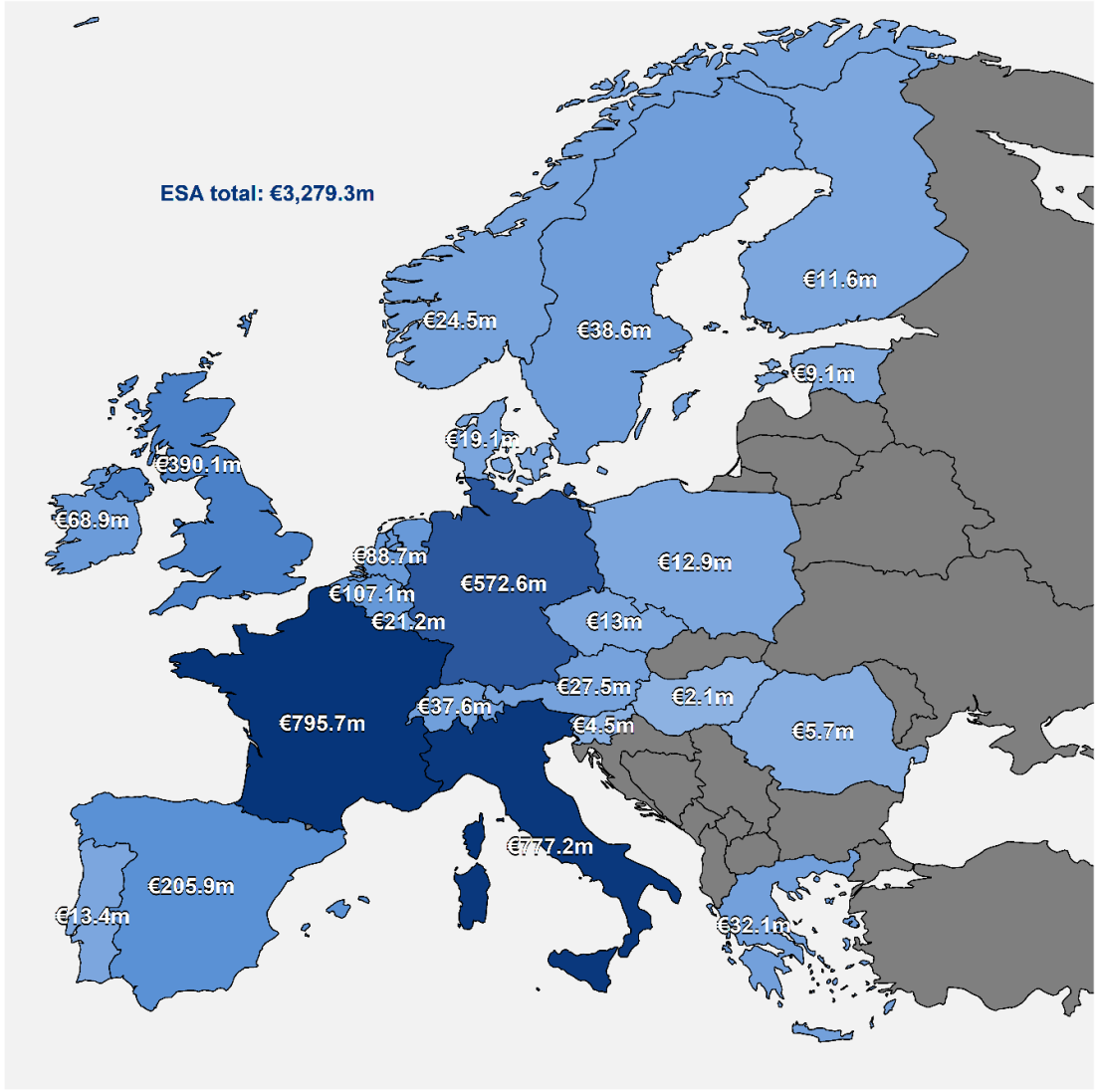
Airbus Defence And Space

Thales Alenia Space

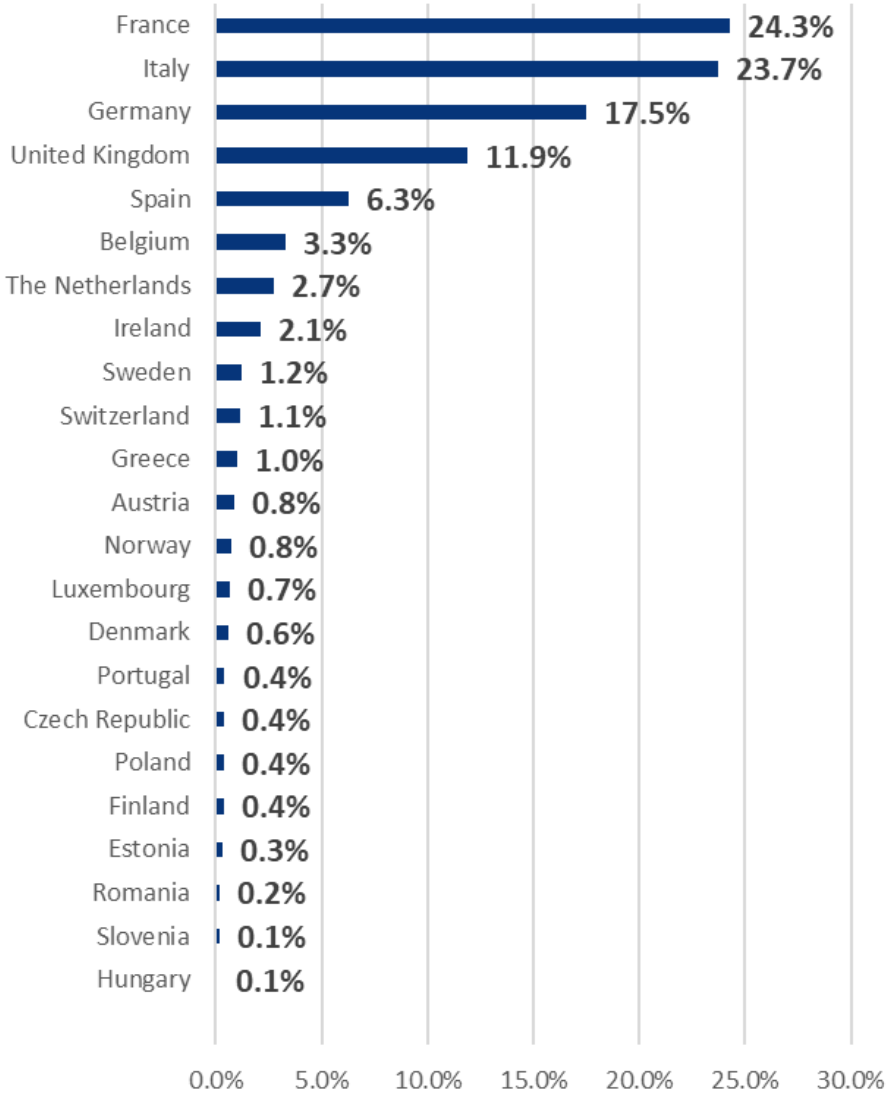
Commercial EO market in 2018, by Member State



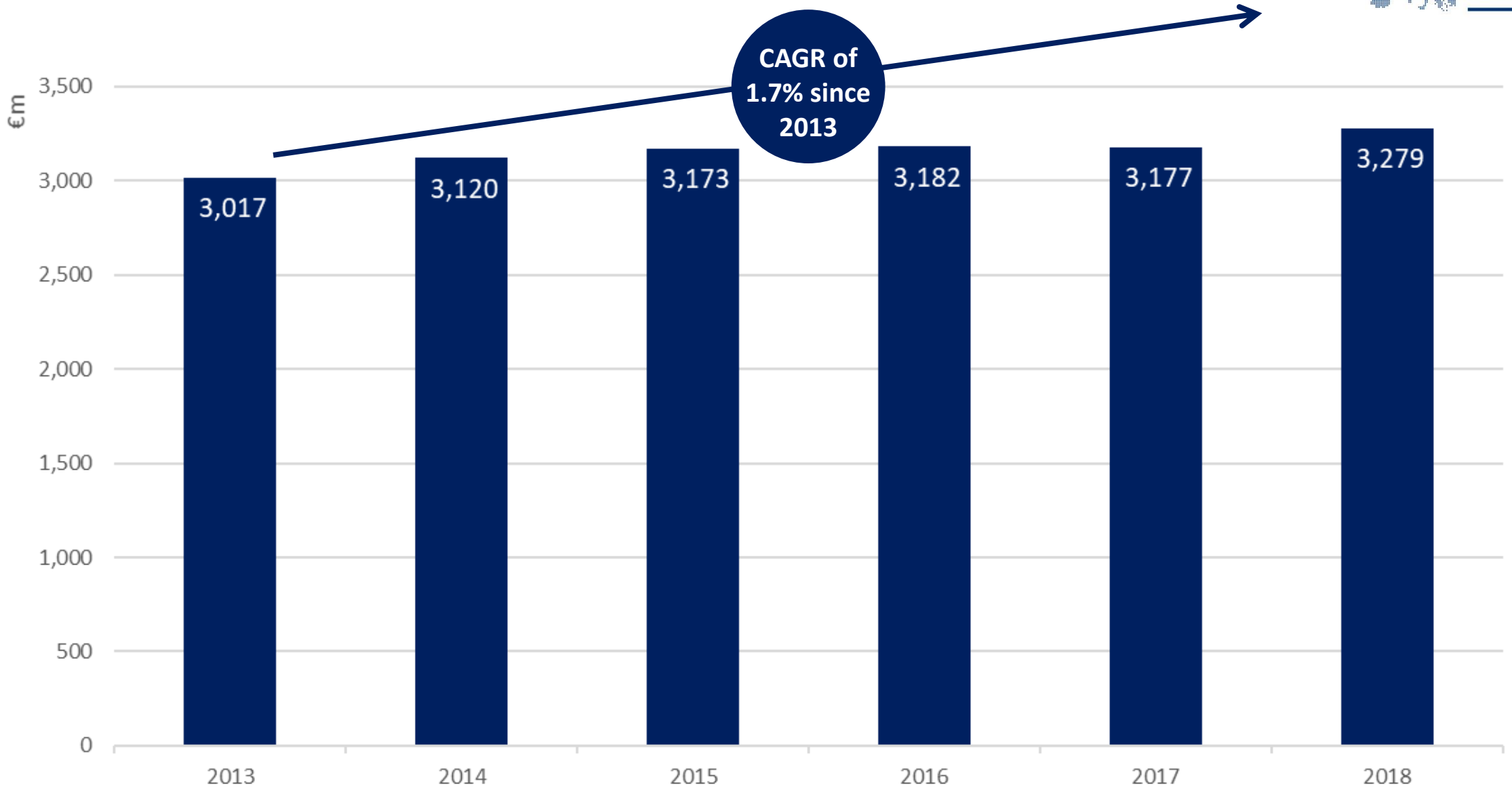
Total EO turnover in 2018, by Member State



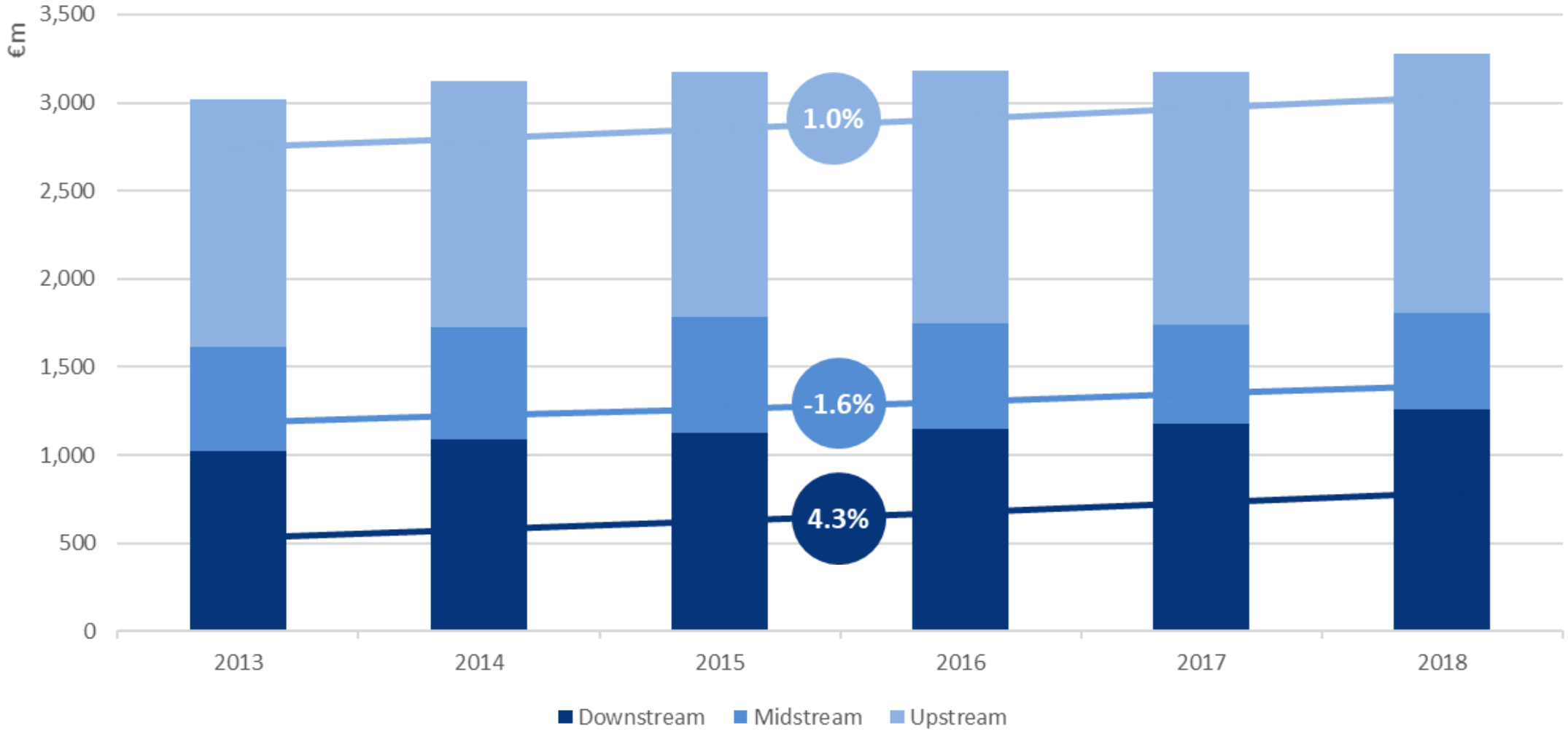
EO turnover shares of total



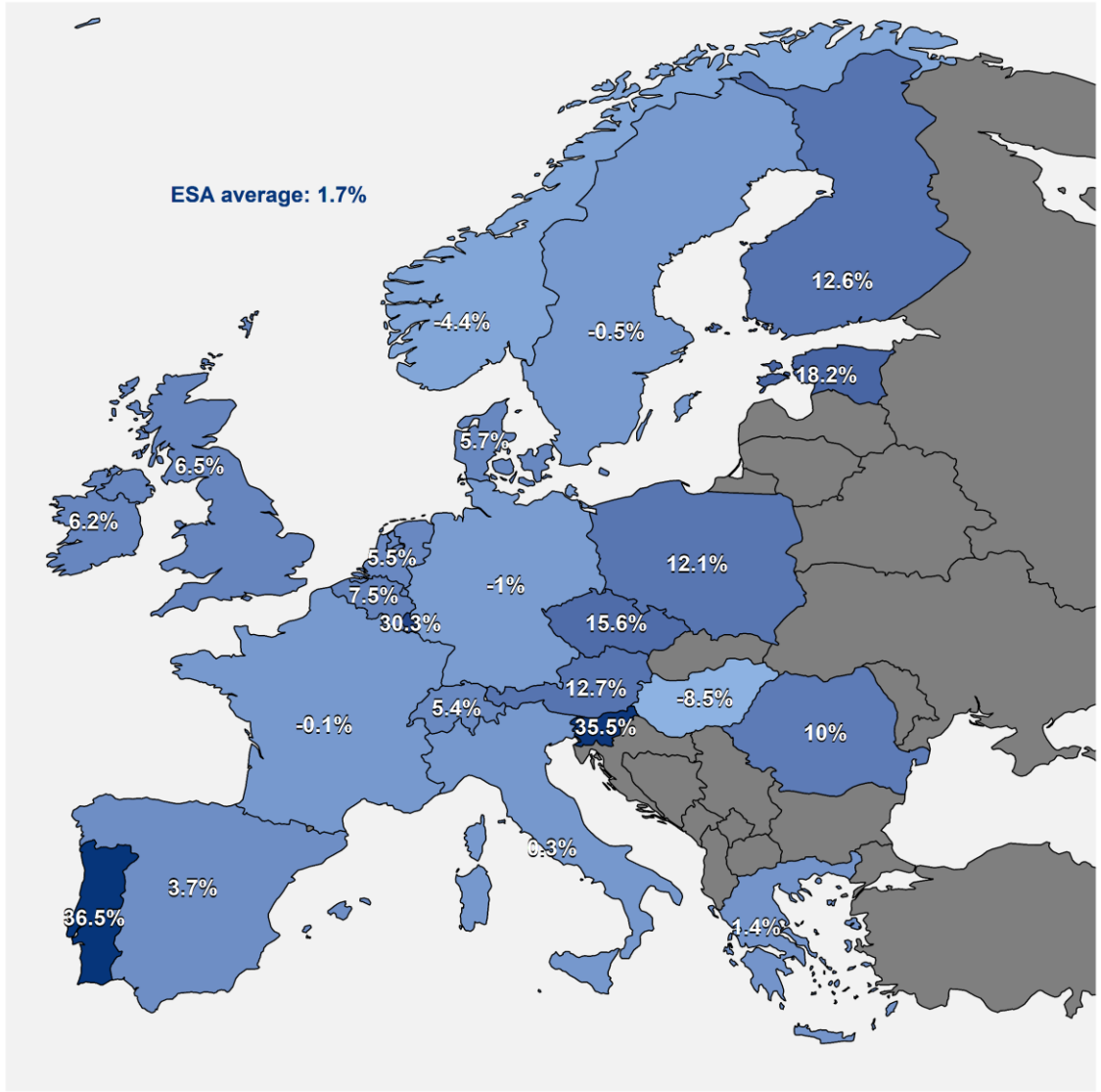
Commercial EO turnover (2013-18), 2018 prices



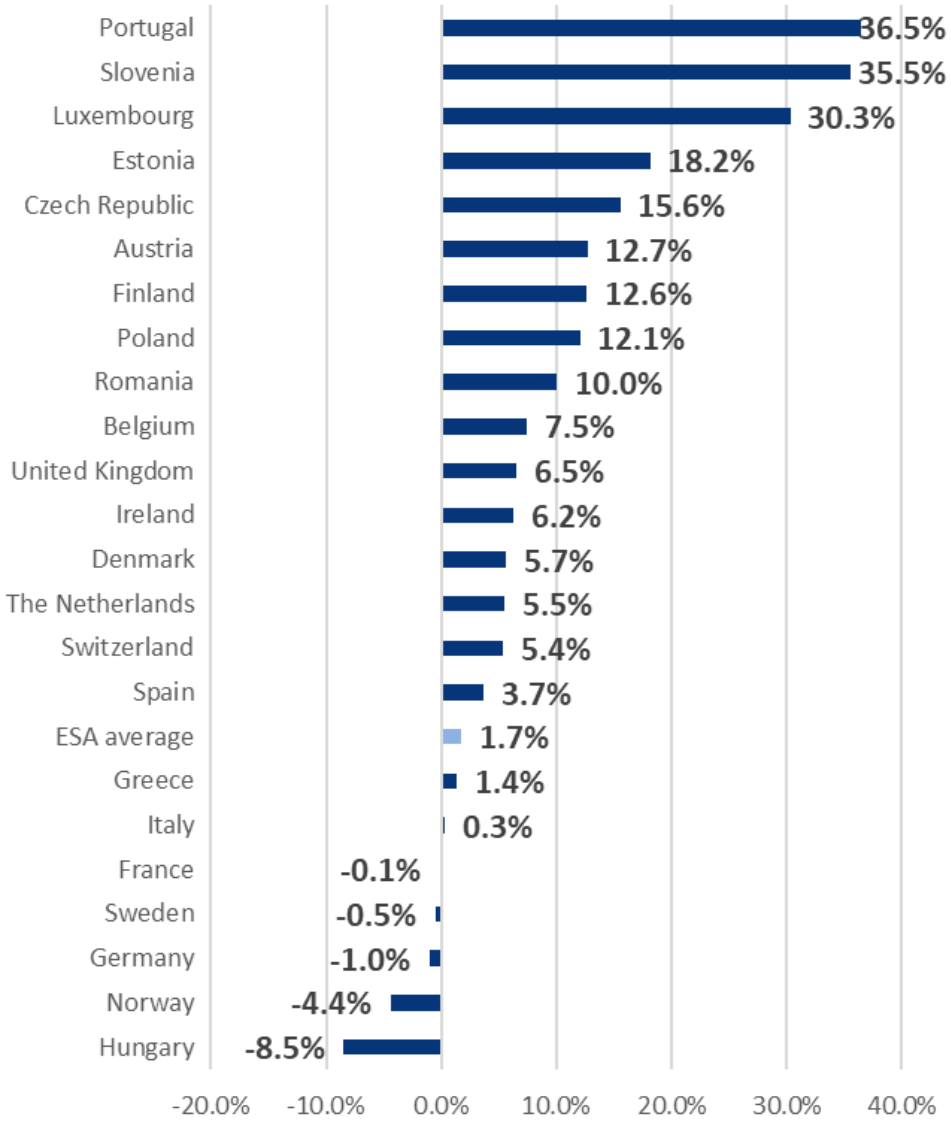
Growth of total EO turnover (2013-18)



EO turnover growth (CAGR 2013-18), by Member State

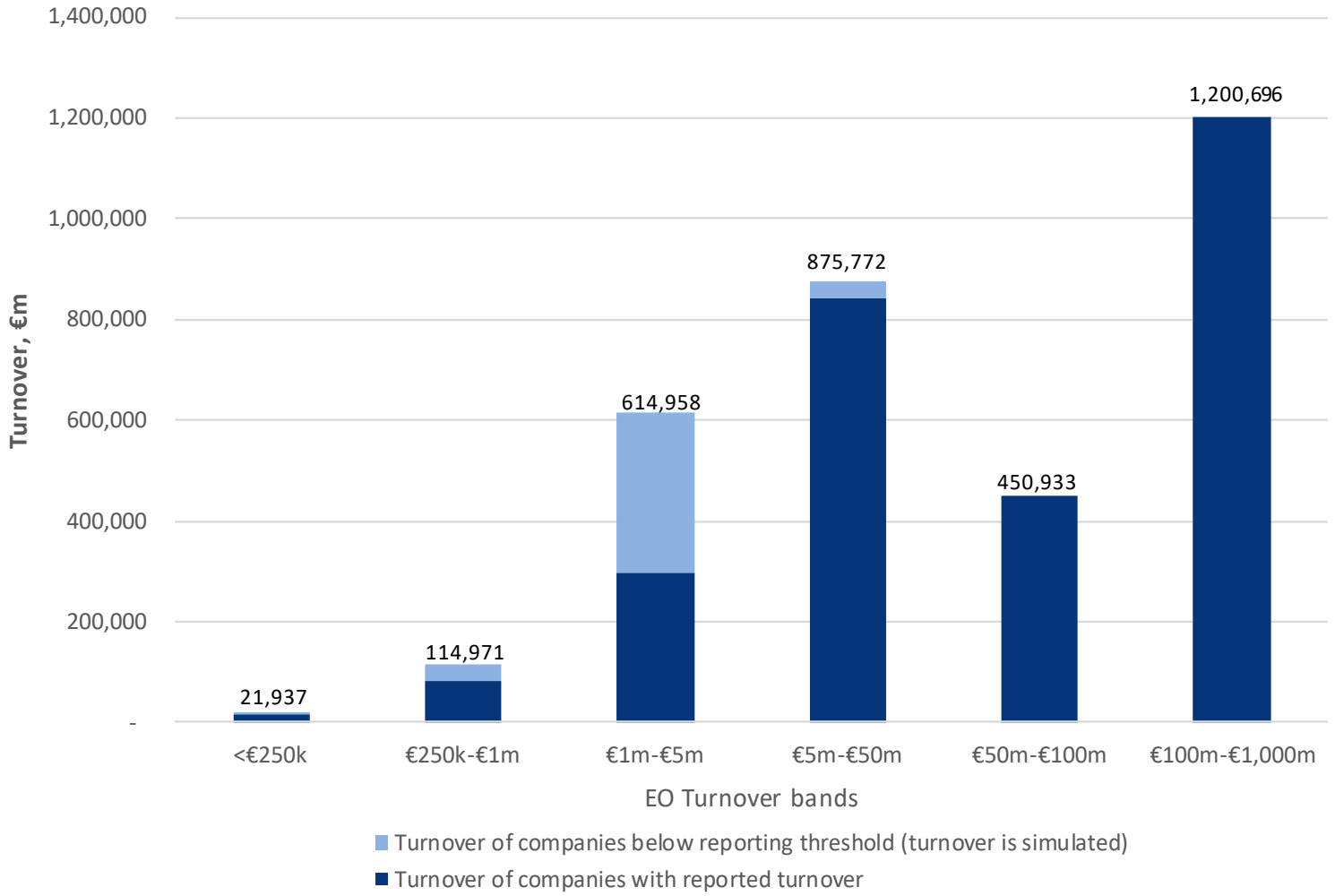


EO growth of turnover



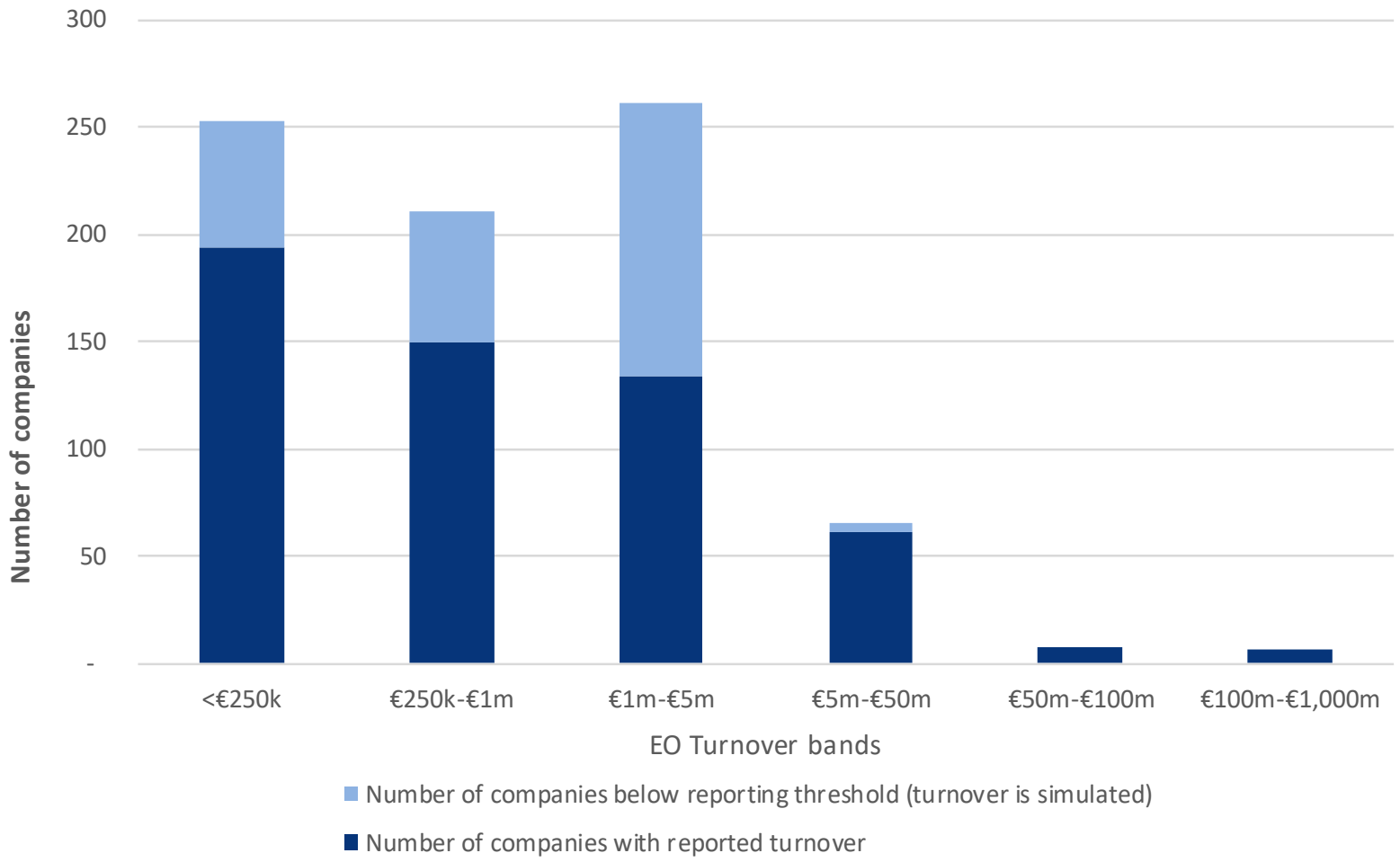
Commercial EO turnover (2018), by turnover band

The majority of EO turnover (88%) is accounted for by companies that report turnover. A minority of EO turnover (12%) is accounted for by companies that do not report it. This is the case for small companies below the statutory reporting threshold for annual accounts. Turnover is estimated for these companies based on empirical rules (see methodology).

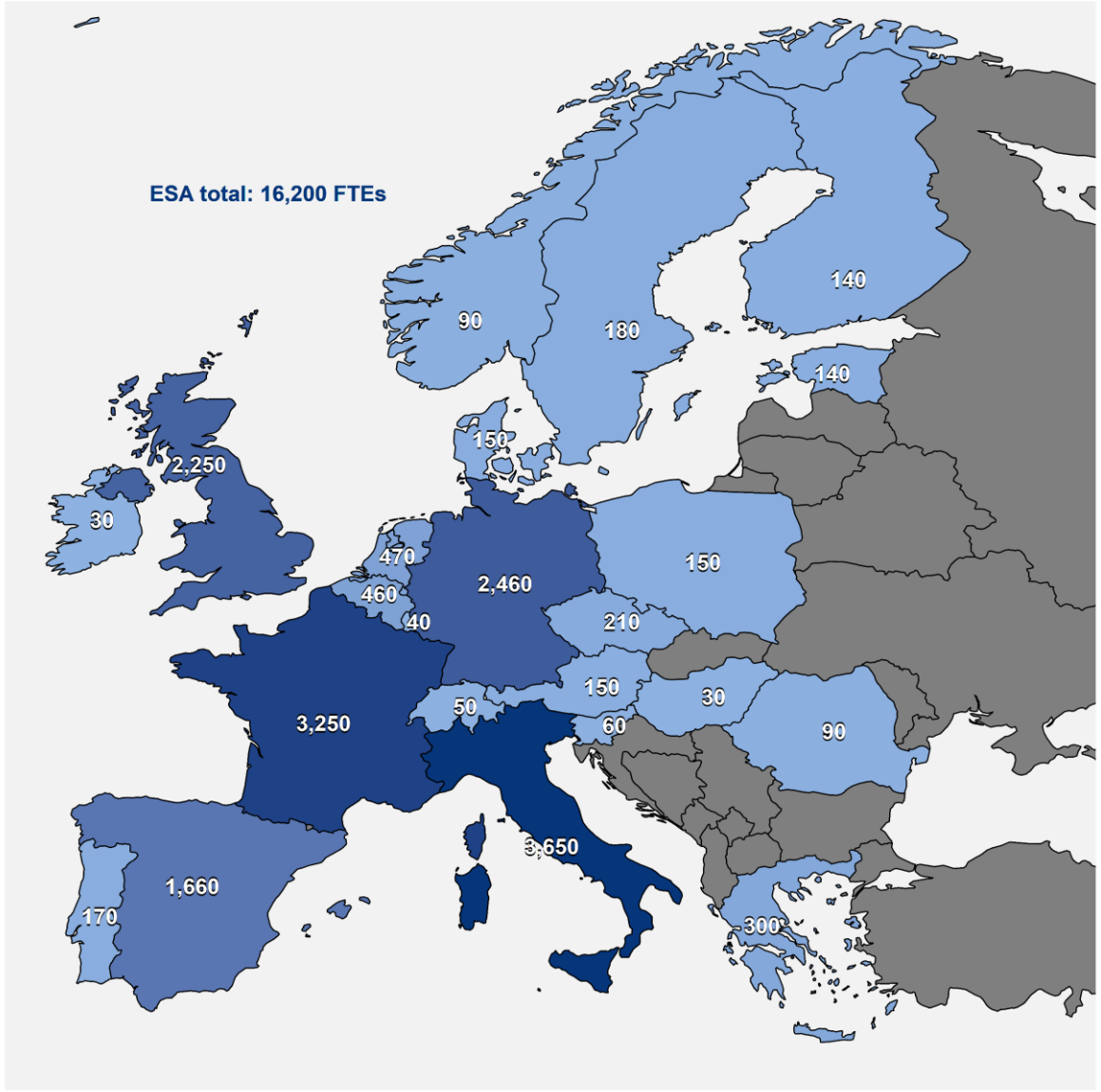


Number of EO companies (2018), by turnover band

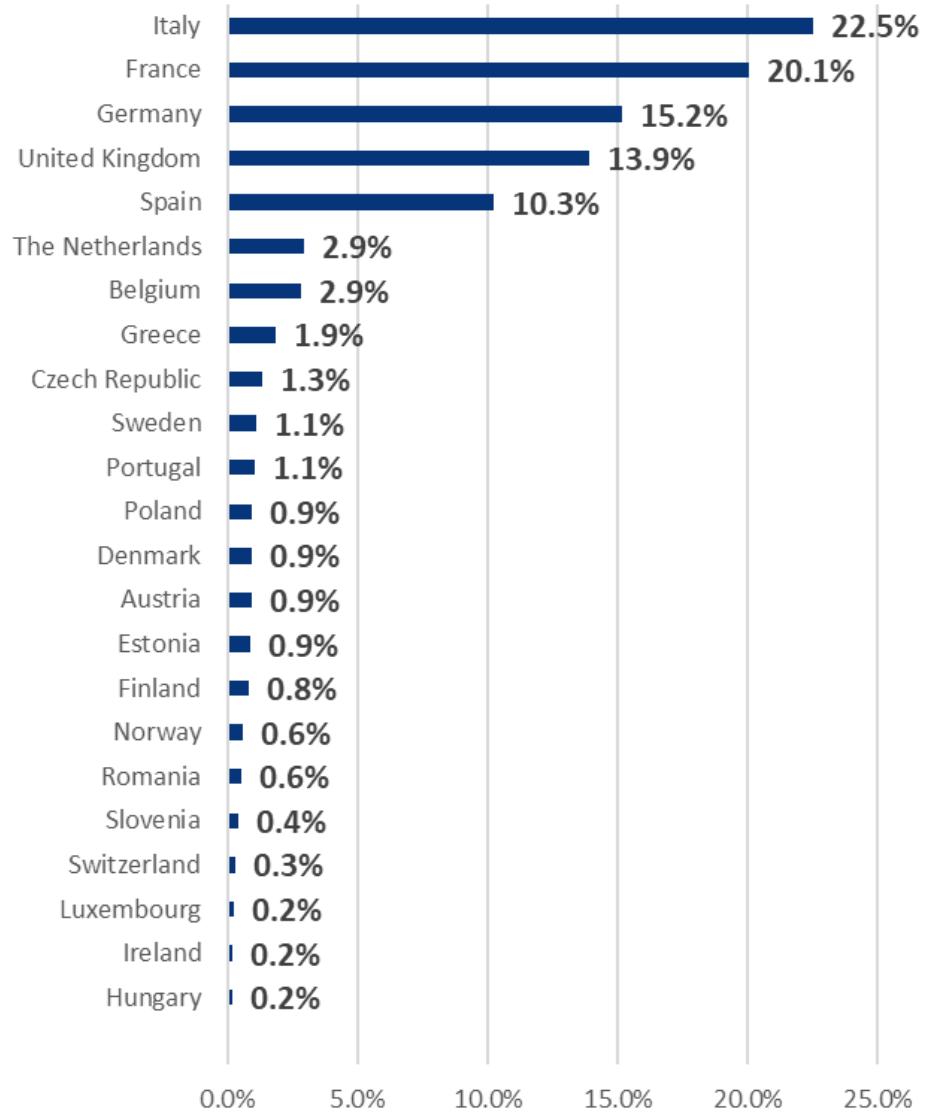
Most EO companies (553) report turnover. A minority of companies (251) do not report turnover. This is the case for small companies below the statutory reporting threshold for annual accounts. Turnover is estimated for these companies based on empirical rules (see methodology).



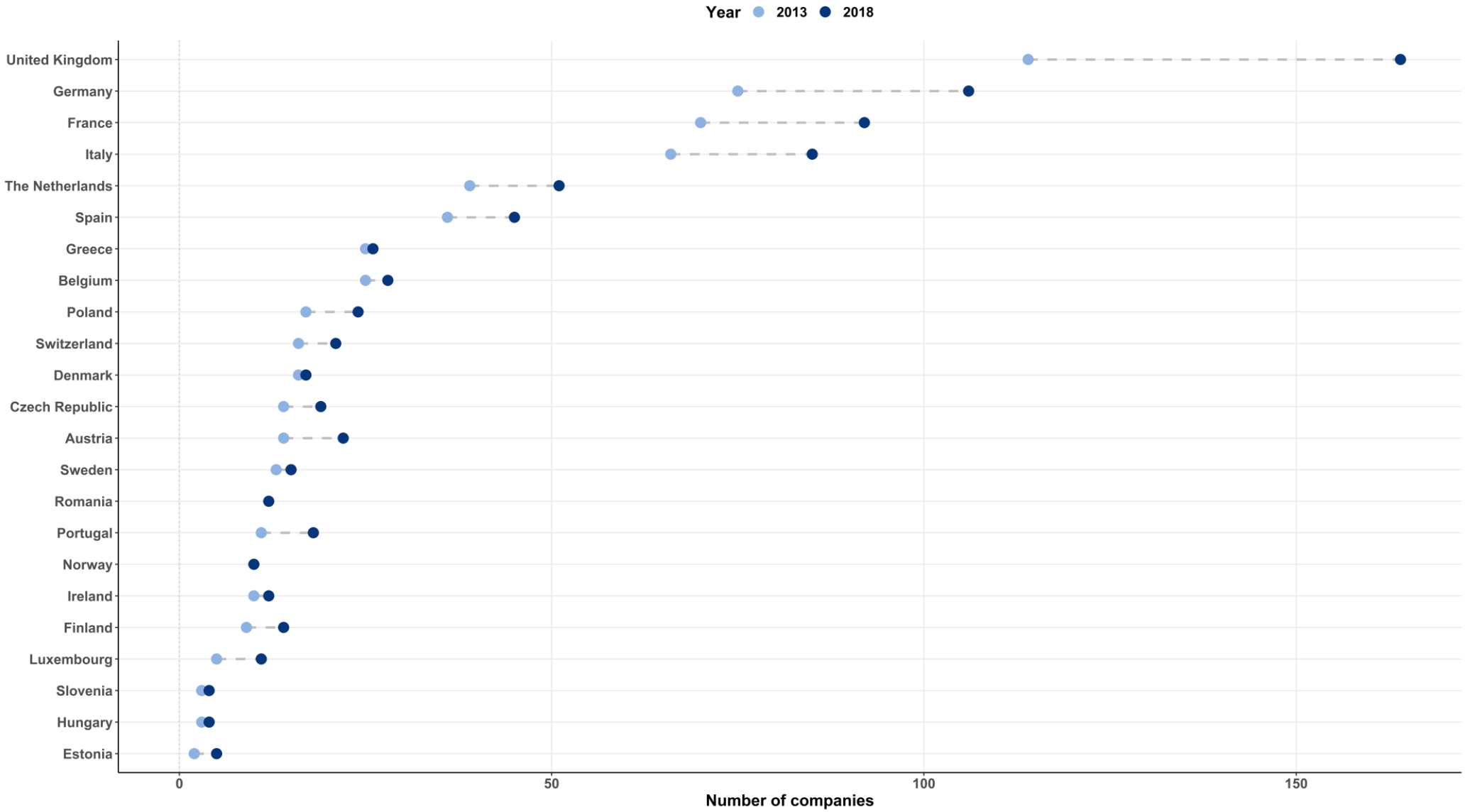
Commercial EO employment (FTEs) in 2018, by Member State



Commercial EO employment shares of Europe total



Number of commercial EO companies in 2013 and 2018



Largest EO companies (turnover) in 2018

1	Thales Alenia Space	
2	Airbus Defence And Space	
3	Thales Alenia Space	
4	Telespazio	
5	Airbus Defence And Space	
6	Airbus Defence And Space	
7	OHB System	
8	Indra Sistemas	
9	CLS	
10	Tesat-Spacecom	

11	Leonardo	
12	Airbus Defence And Space	
13	E Geos	
14	OHB Italia	
15	Oracle	
16	Flemish Institute For Technological Research	
17	European Space Imaging	
18	Jena-Optronik	
19	Leosphere	
20	Telespazio	

Largest EO companies (turnover) in 2018, by Member State

Austria
Ruag Space
Geoville
EOx
Pessl Instruments
EOvision

Belgium
Flemish Institute For Technological Research
Thales Alenia Space
Spacebel
Adv Mech & Opt Syst - Amos
Antwerp Space

Czech Republic
Cgi It Czech Republic
Geoinformation Service Gisat
Honeywell International
Arcdata
Geotest

Denmark
Gomspace
Niras
Gatehouse
Esvagt
Terma

Estonia
CGI
Datel
Guardtime
Kappazeta
Spaceanalyzer

Finland
Da-Design
Tracker
Space Systems Finland Ltd
Arbonaut
Ruag Space Finland

France
Airbus Defence And Space
Thales Alenia Space
CLS
Leosphere
Telespazio

Germany
Airbus Defence And Space
OHB System
Tesat-Spacecom
European Space Imaging
Jena-Optronik

Greece
Space Hellas
European Dynamics
Terra Spatium
Neuropublic Ae Pliroforikis & Epikoinonion
Draxis Environmental

Hungary
C3S Electronics
Geonardo Environmental Technologies
Admatis - Advanced Materials In Space

Ireland
Oracle
Farran Technology
Skytek
Bantry Marine Research Station Limited
Aws Ireland

Italy
Thales Alenia Space
Telespazio
Leonardo
E Geos
OHB Italia

Luxembourg
European Dynamics Luxembourg
Earthlab Luxembourg
Space4Environment

The Netherlands
Fugro
CGI
Airbus Defence And Space
BMT Argoss
Capgemini

Norway
Kongsberg Defence & Aerospace
Kongsberg Norspace
Kongsberg Satellite Services
Airbus Defence And Space
Science [&] Technology

Poland
FP Space
Creotech Instruments
Eversis
Capgemini
Cloudferro

Portugal
Tekever Asds
Edisoft
Critical Software
Active Space Technologies
Spin.Works

Romania
Terrasigna
Rartel
Eurosense Romania
Airbus Defence And Space Romania
ESRI

Slovenia
Sinergise
Skylabs
Aalta Lab

Spain
Indra Sistemas
Airbus Defence And Space
Thales Alenia Space Espana
Hisdesat Servicios Estratégicos
Computadoras Redes E Ingenieria

Sweden
OHB
Ruag Space
Metria Miljoeanalys
Omnisys Instruments
Sogeti

Switzerland
Syderal
Gamma Remote Sensing
Sarmap
Mfb-Geoconsulting
Capgemini

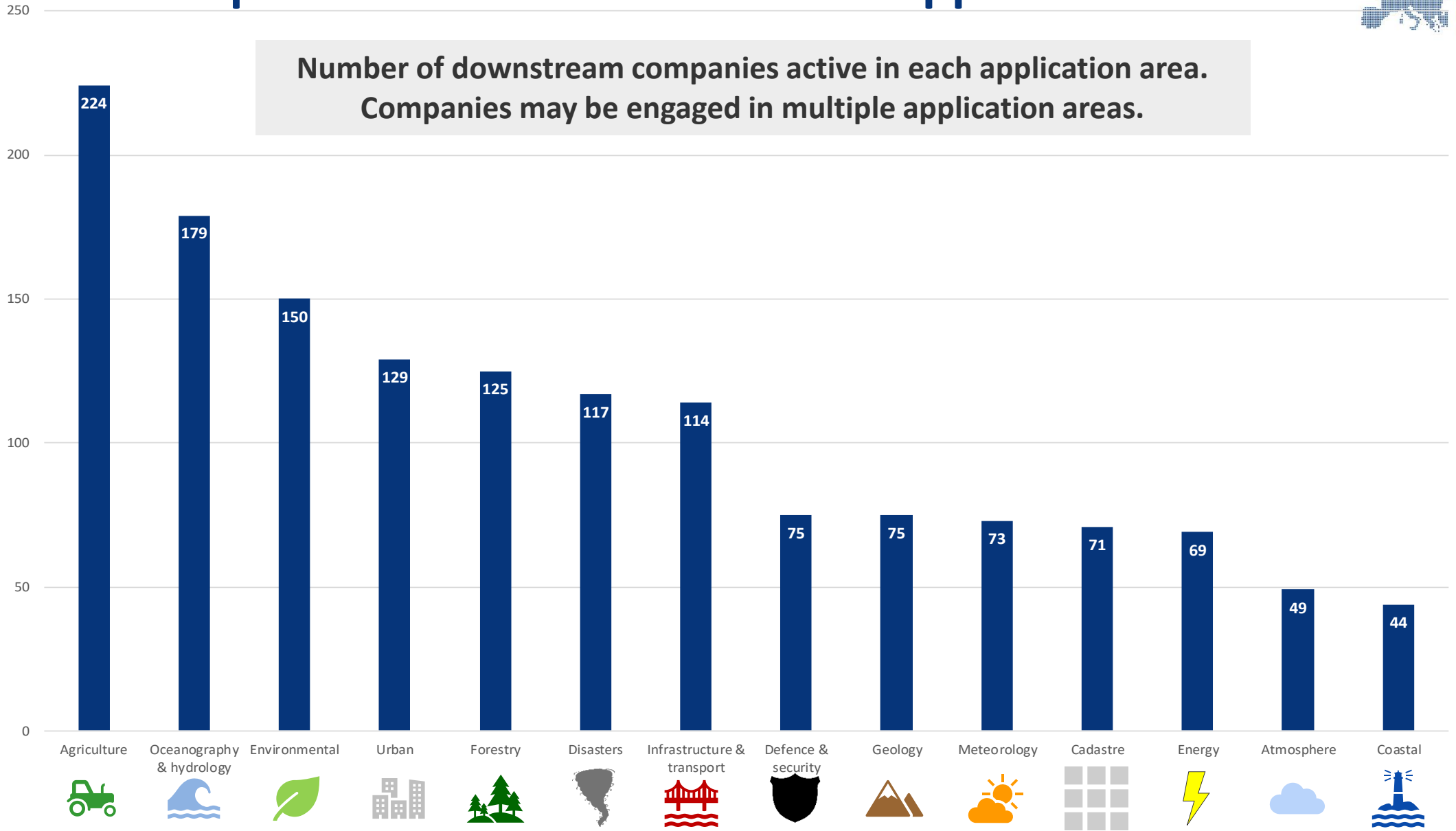
United Kingdom
Airbus Defence & Space
Surrey Satellite Technology
Thales Alenia Space
Teledyne E2V
Telespazio Vega

Only companies for which turnover data is provided are included in this list

Largest companies (turnover) in 2018, by value chain

Upstream Manufacture of satellites and instruments	Midstream Data acquisition and storage and distribution	Downstream Data processing, analysis and insight
Thales Alenia Space	Telespazio	Telespazio
Thales Alenia Space	Tesat-Spacecom	Airbus Defence And Space
Airbus Defence And Space	Airbus Defence And Space	Indra Sistemas
Airbus Defence And Space	CLS	Oracle
OHB System	Airbus Defence And Space	Leonardo Spa
Airbus Defence And Space	Airbus Defence And Space	CLS
OHB Italia	Airbus Defence And Space	E Geos
Jena-Optronik	European Space Imaging	Leosphere
Surrey Satellite Technology Limited	E Geos	Telespazio
Thales Belgium	Leonardo	Flemish Institute For Technological Research

Number of companies active in downstream applications



Summary of size and growth of EO in 2018 (Europe) (1/2)

- This study identified **805** registered commercial organisations in Europe that generate turnover from activities related to satellite-derived Earth Observation. This activity amounted to **€3.3bn** in turnover in 2018.

- France (**€796m** or 24.3%), Italy (**€777m** or 23.7%) and Germany (**€573m** or 17.5%) have the largest national EO industries in the 23 countries assessed as part of this analysis.

- Despite starting from a small base, Portugal, Slovenia, and Luxembourg have been the strongest performers in growth terms. All three countries have experienced growth of **over 30%** per annum between 2013 and 2018.

- By comparison, the average annual growth rate across all 23 countries over this period was **1.7%**, encompassing large growth in Member States with small EO industries and more modest growth in the countries with larger EO economies. Negative growth rates are explained by either the attrition of companies from the EO industry, a decline in revenues of leading EO companies, or adverse exchange rate movements.

- Turnover growth varies across value chain segments. Between 2013 and 2018, the downstream segment has grown the most (**4.3%** per annum growth), the upstream has grown modestly (**1.1%**) and the midstream has shrunk (**-1.6%**).

Summary of size and growth of EO in 2018 (Europe) (2/2)

- Commercial EO organisations in Europe employed a total of **16,200 FTEs** in 2018. Italy (**22.5%**), France (**20.0%**), Germany (**15.2%**) and the UK (**13.9%**) account for the largest share of EO employment.

- In terms of the number of commercial organisations identified as EO, the UK leads with a total of **164** registered companies in 2018, up from 114 in 2013.

- With aggregate growth of organisations of more than **50%** between 2013 and 2018, Luxembourg (5 to 11), Estonia (3 to 6), Portugal (11 to 18), Austria (14 to 22), and Finland (9 to 14) have seen the largest relative increase in organisations that are active in commercial EO.

- National subsidiaries of Airbus Defence & Space are leaders in all areas of the EO market, with national subsidiaries of Thales Alenia Space, Telespazio and Leonardo leading in specific market segments. This dominance drives the rankings of specific countries.

- Commercial downstream organisations in the European EO industry specialise across a variety of applications to deliver services to customers and users. Agriculture, oceanography & hydrology, and environmental applications have the greatest number of active organisations.

Summary of NewSpace EO market assessment (Europe)

- Turnover (2018 prices)
- Employment (full time equivalent)
- Market share
- Leading companies
- Summary

Definitions and scope

This section presents the results of LE's assessment of the NewSpace EO industry (a subset of the EO industry more broadly). The definition of 'NewSpace' used for this study is presented in the following slides.

- **Earth Observation** – satellite-derived remote-sensing.
- **NewSpace** – the segment of the EO industry that focuses on *'lowering the barriers to the space industry'* and *'providing cheaper access to space and more high-quality and affordable data'.* It is characterised by companies that are new and/or disruptive and commercially focussed.
- **Organisation** – commercial organisations only.
- **Geographical scope** – ESA's 22 full member states and Slovenia.
- **Time scope** – from 2013 to 2018.
- All figures are presented in **2018 prices**.

Assessment of NewSpace relevance (1/2)

- 'NewSpace' is an intangible concept that lacks a consistent definition. A common consensus is that NewSpace is an approach that focuses on *'lowering the barriers to entry to the space industry'* and *'providing cheaper access to space and more high-quality and affordable data'.*

- The characteristics of NewSpace as defined above, are often difficult to observe through assessments of publicly-available company-level data alone (e.g. websites, annual accounts, product lists, catalogues).

- For the purpose of this study, NewSpace relevance has been defined at the company-level based on the following criteria that can be observed from publicly-available company-level data:

  - These organisations can be evidenced as being active in the space (specifically EO) industry – as suppliers of EO-relevant products and services.

  - These organisations can be evidenced as being commercially-focused: Business-to-Business (B2B); Business-to-Consumer (B2C) or Business-to-Government (B2G) on a commercial basis.

Assessment of NewSpace relevance (2/2)

- These organisations are disruptive: i.e. there is evidence of one or more of the following:
  - Private funding (particularly venture capital);
  - A focus on business activities that use any of the following disruptive technologies or innovative approaches (that can be evidenced):
    - **Upstream**: CubeSats / nanosatellites, 'Industry 4.0', cyber-physical systems, smart manufacturing, 3D or additive manufacturing, automation / robots / cobots, digitalisation of supply chain, low cost access to space, etc.
    - **Midstream**: Cloud computing, big data, data centre, etc.
    - **Downstream**: Big data analytics, Machine Learning, Artificial Intelligence, algorithms, web-based interface, Internet-of-Things (IoT) / Machine-to-Machine (M2M), augmented reality, virtual reality, smart sensors, etc.

- This definition of NewSpace is *not* tied to any age criteria for companies i.e. companies that do not consider themselves as 'start-ups' and which have a long legacy in the EO industry can be considered as 'NewSpace' if there is evidence of them exhibiting any of the characteristics of NewSpace detailed above. In other words, our definition of NewSpace characterises the activities of companies and not specifically the company itself.

Overview of bottom-up analysis: elaborated in later slides

Identification

- ESA lists of funded organisations
- Lists of grantees of EU Framework Programmes (in ESA Member States)
- National space/EO catalogues (received from AT, CZ, DE, DK, EL, ES, FI, HU, IE, IT, LU, NL, PL, PT, SE, UK)
- ESA Member States delegates comments (received from CZ, EE, DE, EL, LU, and SI by early July 2019)

Assessment

- Analysis of publicly available information on each organisation (e.g. website, annual report, presentation, catalogue entry). Only commercial organisations in scope.
- Determine key shares of company turnover, based on public data (e.g. annual report or no. of products meeting conditions): **EO** and **Value Chain Segment**
- Determine binary parameters: **ESA Member State** (for organisations with subsidiaries in many states, each subsidiary represents its home state); **NewSpace** (if a company meets the observable NewSpace definition (elaborated in later slides), all its activity is classed as NewSpace); **application area** (the parameter shows whether the organisation is active, but not its share of turnover)

Financial data

- Extraction of turnover and employment data from financial databases, annual reports and catalogues
- Estimation of turnover and employment data for companies below the statutory reporting threshold using historical data

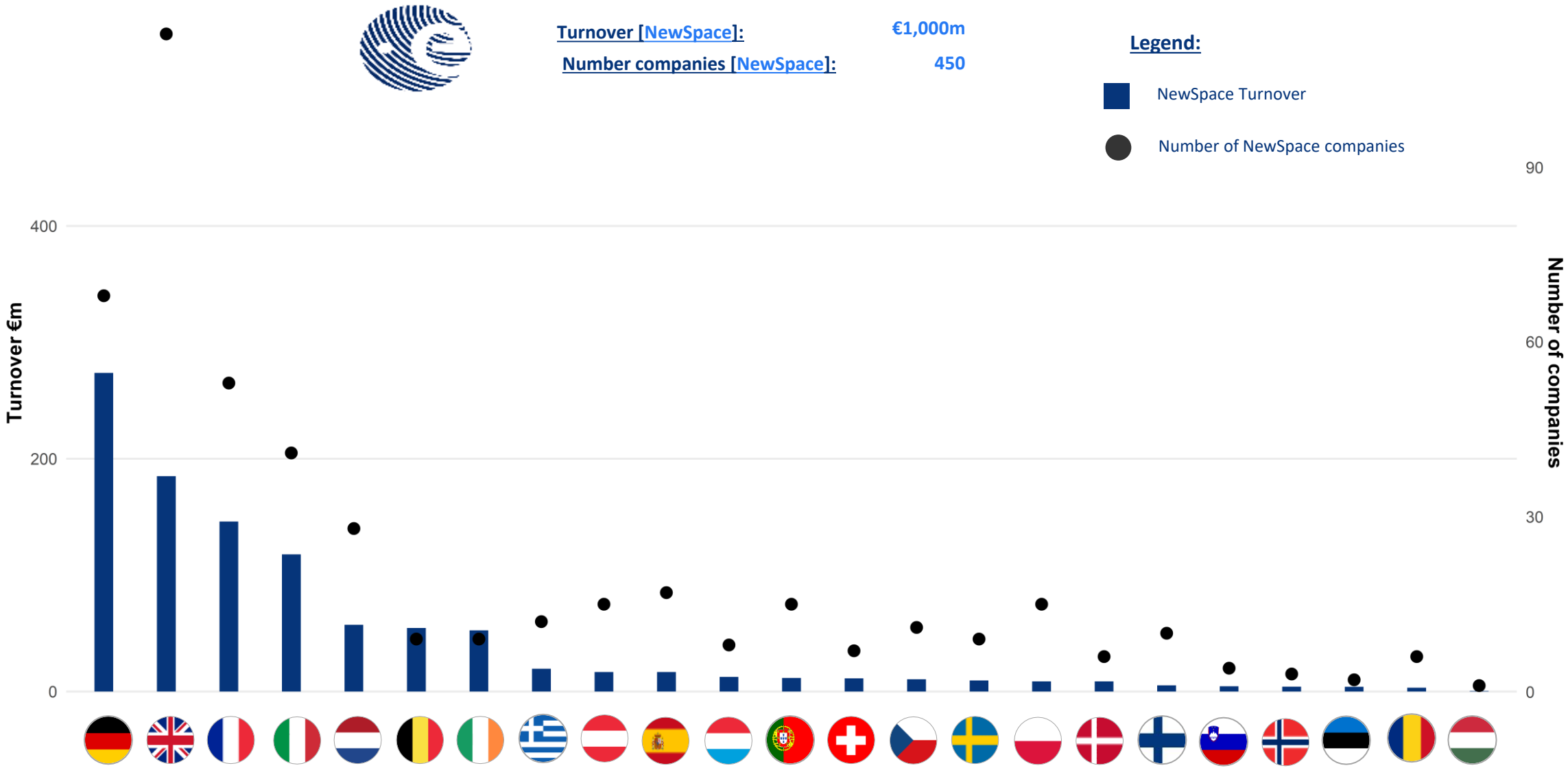
Analysis

- Compilation of **assessment data** (EO, NewSpace, value chain, application area) and **financial data** (turnover, employment) for each organisation.
- Estimation of findings for each organisation: EO turnover; EO employment; NewSpace EO turnover; NewSpace EO employment.
- Aggregation of results to Member State and ESA levels: total EO turnover; total EO employment; total NewSpace EO turnover; total NewSpace EO employment.

Commercial NewSpace EO market in 2018, by Member State

Turnover [NewSpace]: €1,000m

Number companies [NewSpace]: 450



Headline findings on size and growth of NewSpace EO (Europe) in 2018

In 2018, the NewSpace industry has generated:

A turnover of €1,000m

+7.6% CAGR p.a. since 2013

- +3.5% p.a. in the upstream
- +4.2% p.a. in the midstream
- +10.3% p.a. in the downstream

Companies are most active in:

Agriculture

Oceanography

Environment

In 2018, the NewSpace market has:

450 registered companies

6,260 people employed (FTE)

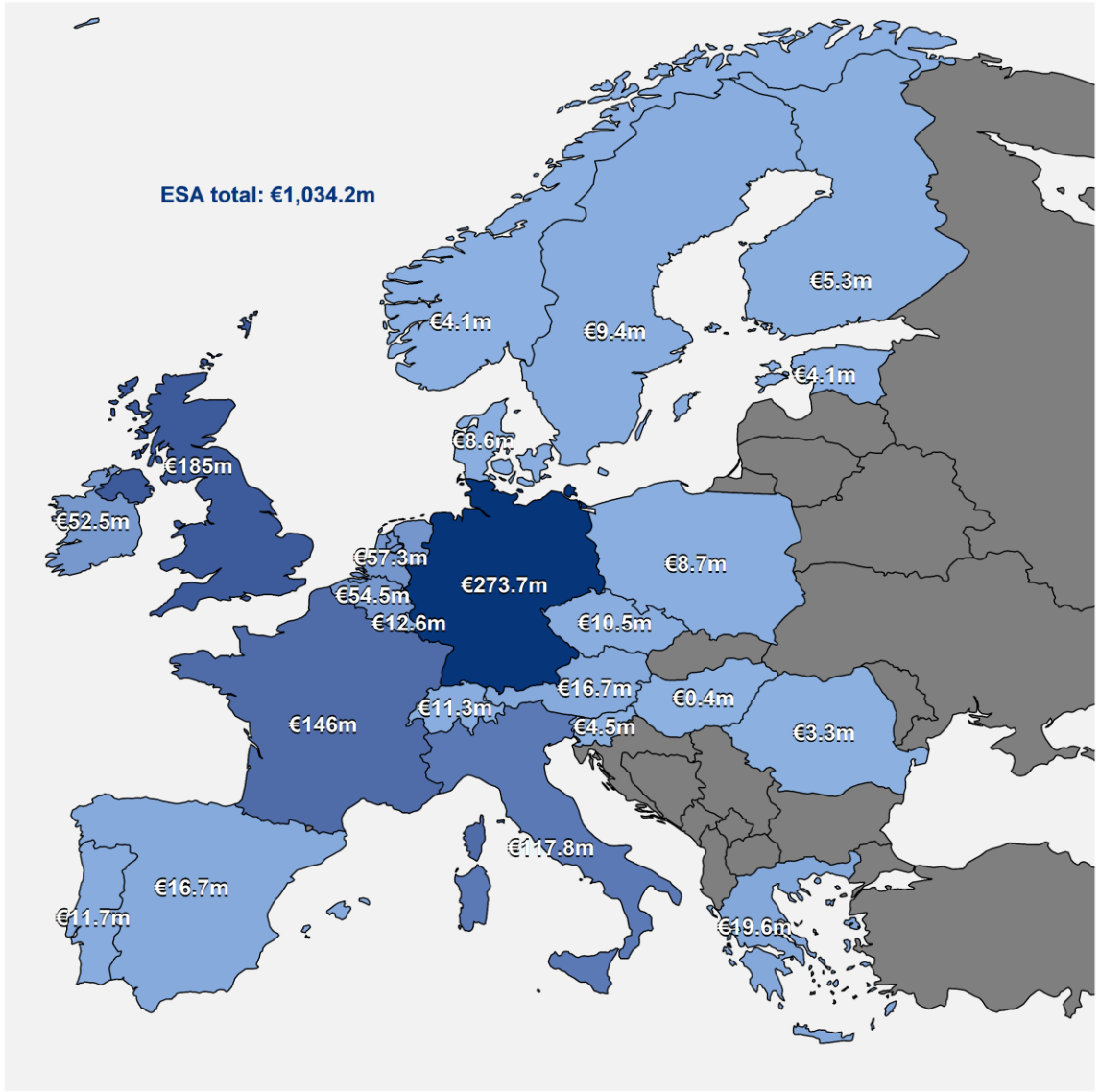
The top 3 companies by NewSpace EO turnover are:

Tesat-Spacecom

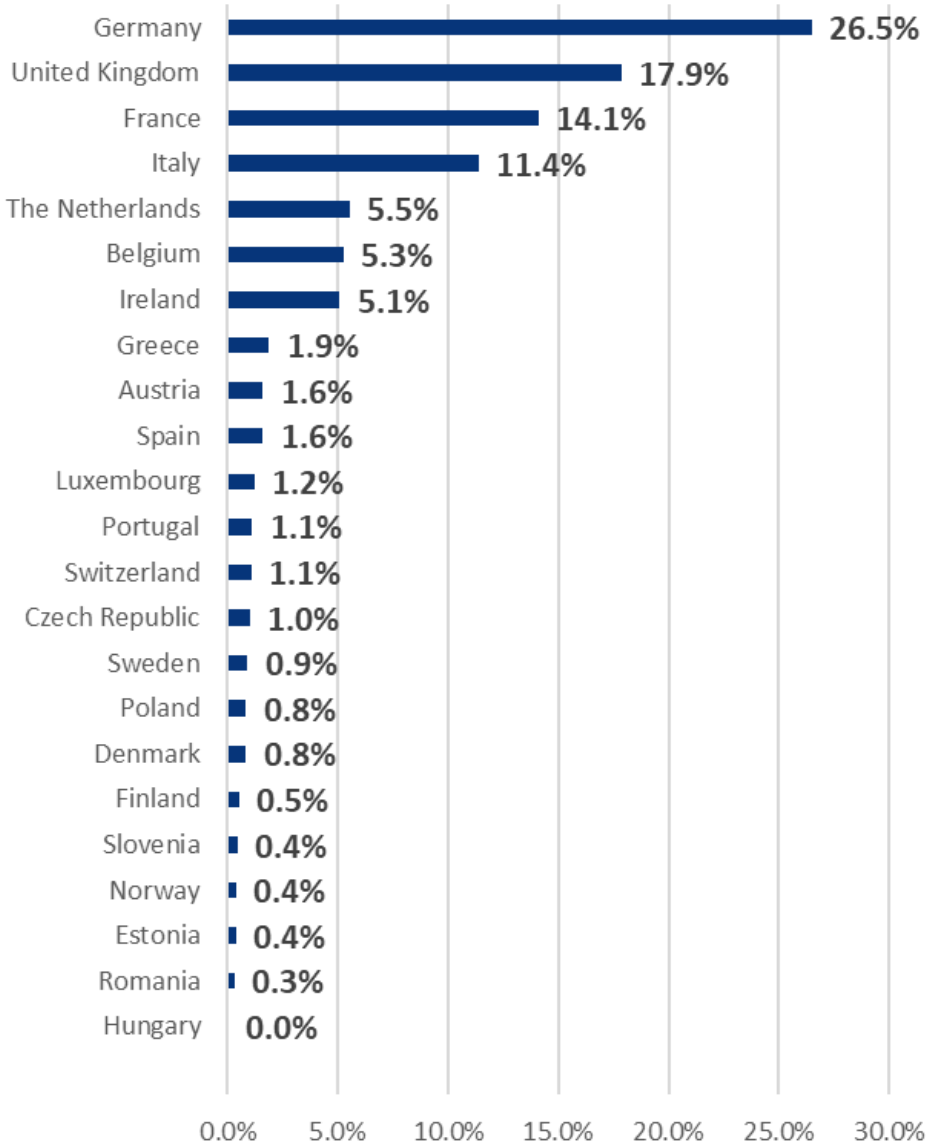
E Geos

Oracle

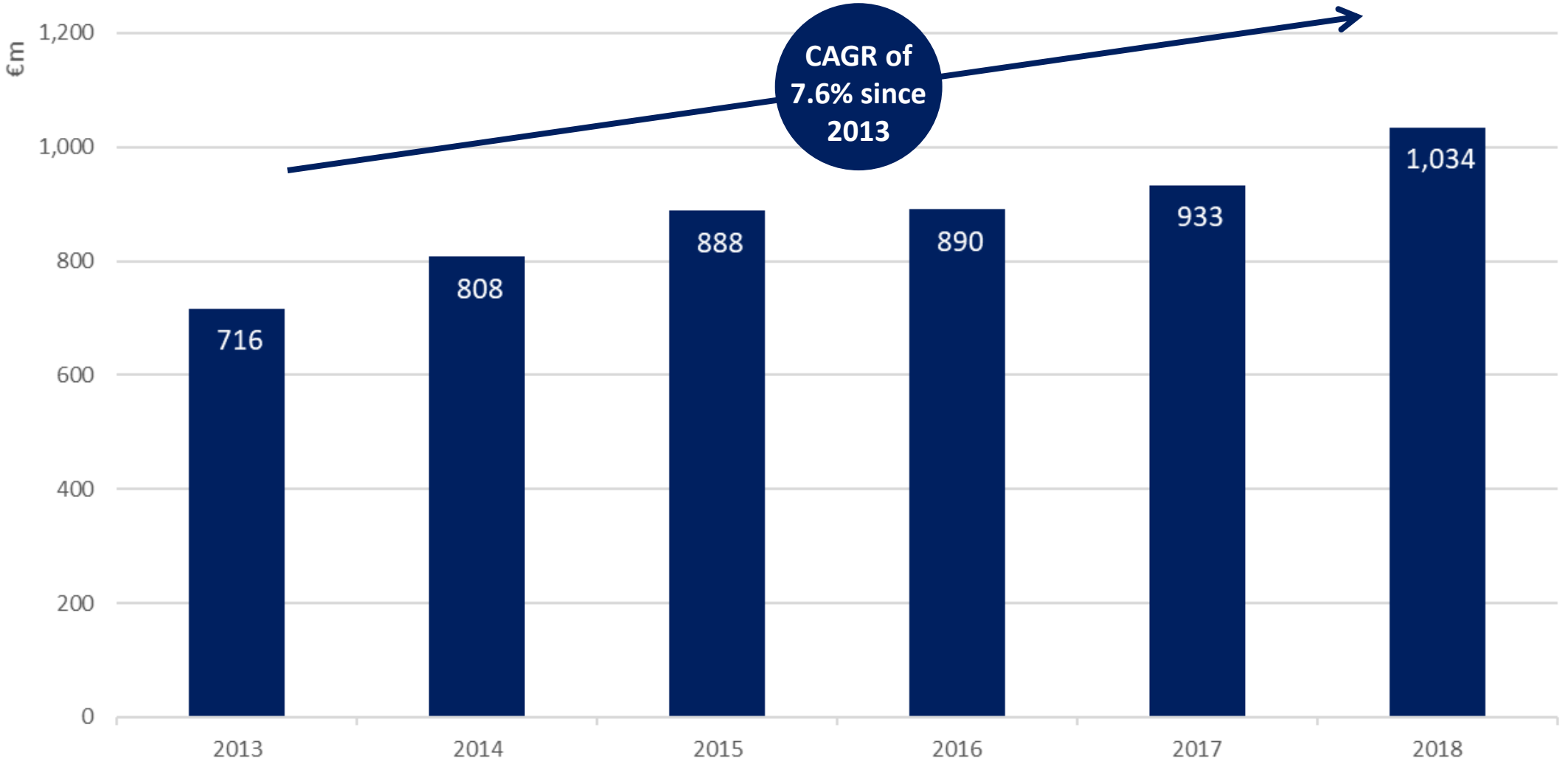
NewSpace turnover, by Member State in 2018



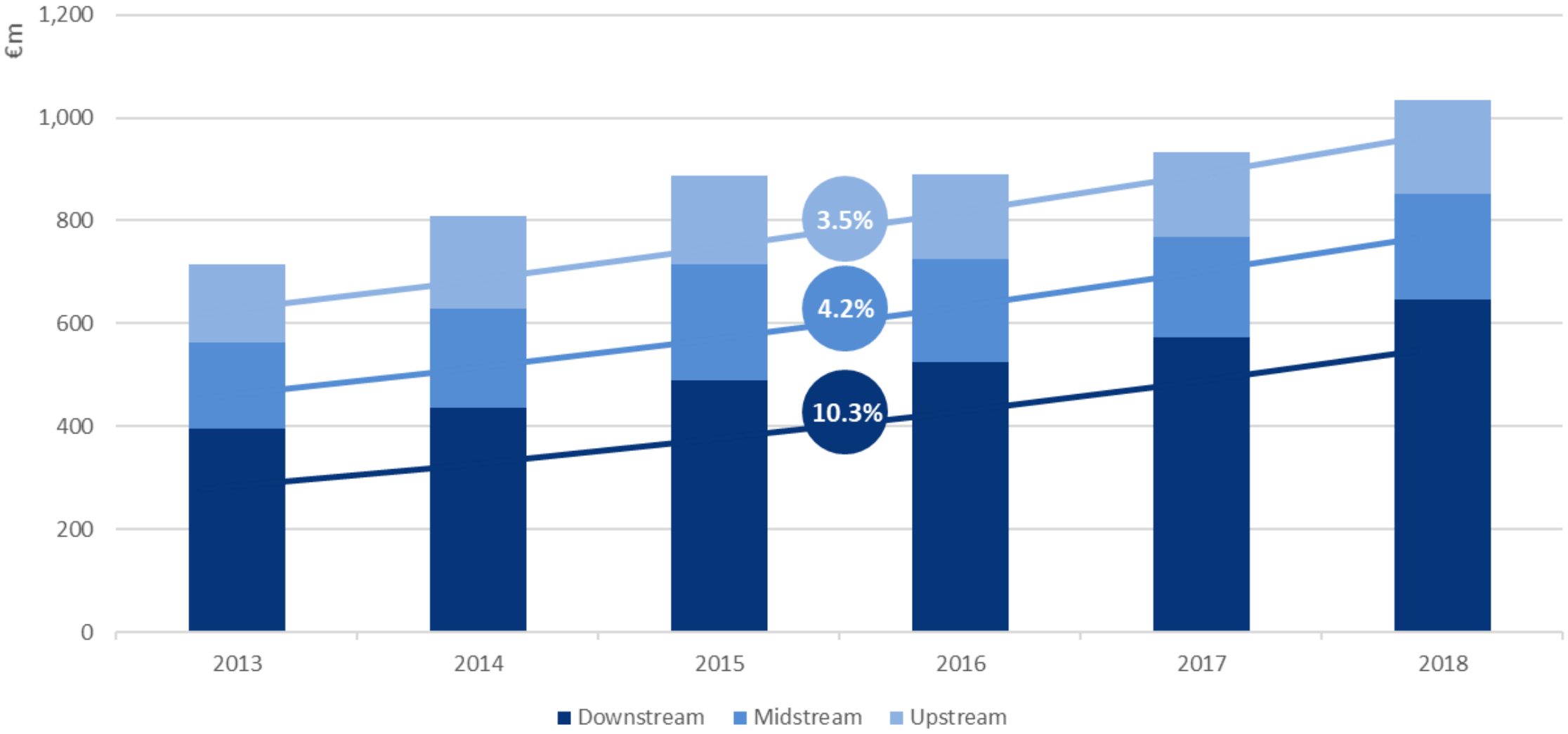
NewSpace turnover market shares



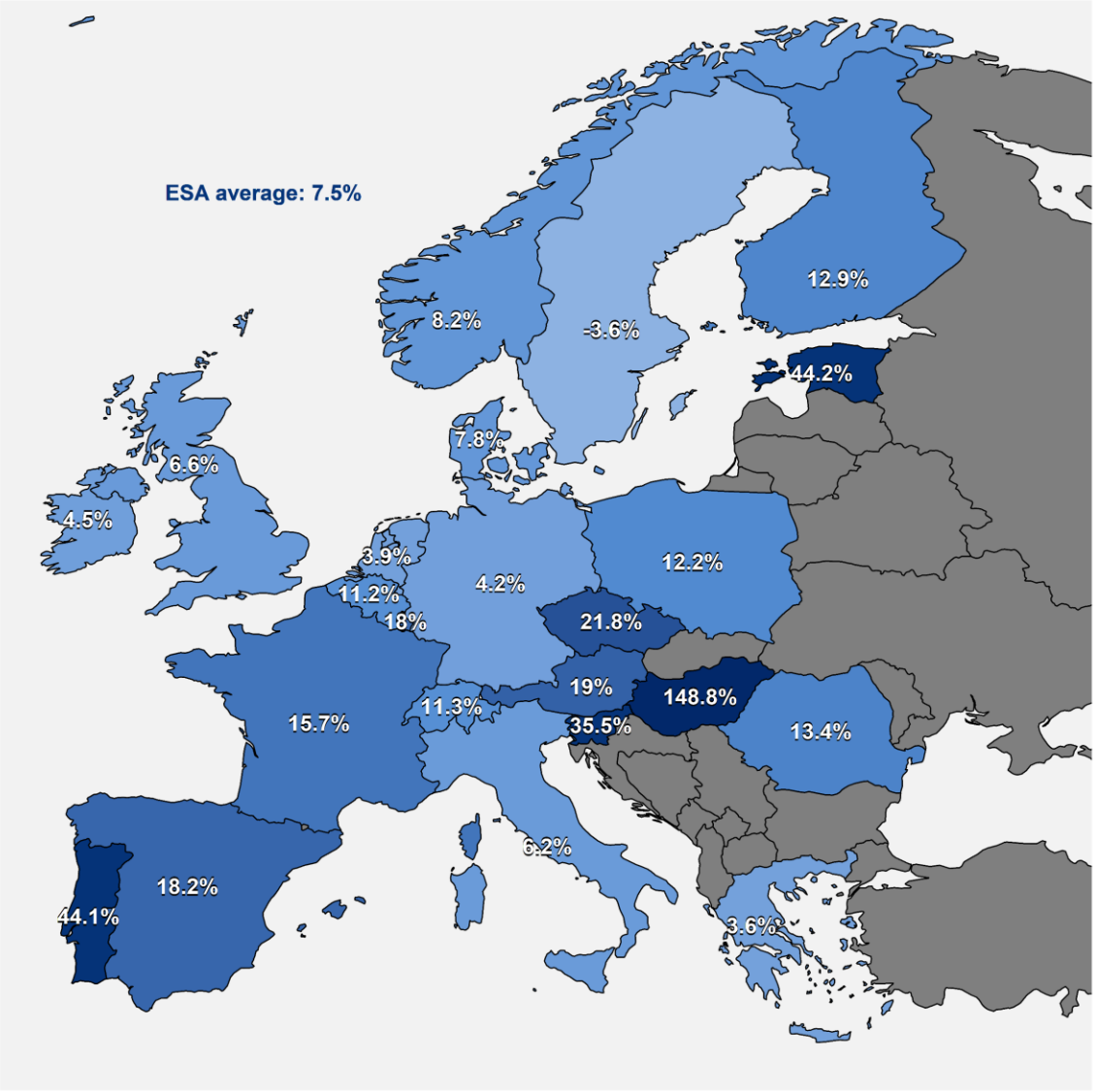
Commercial NewSpace EO turnover (2013-18), 2018 prices



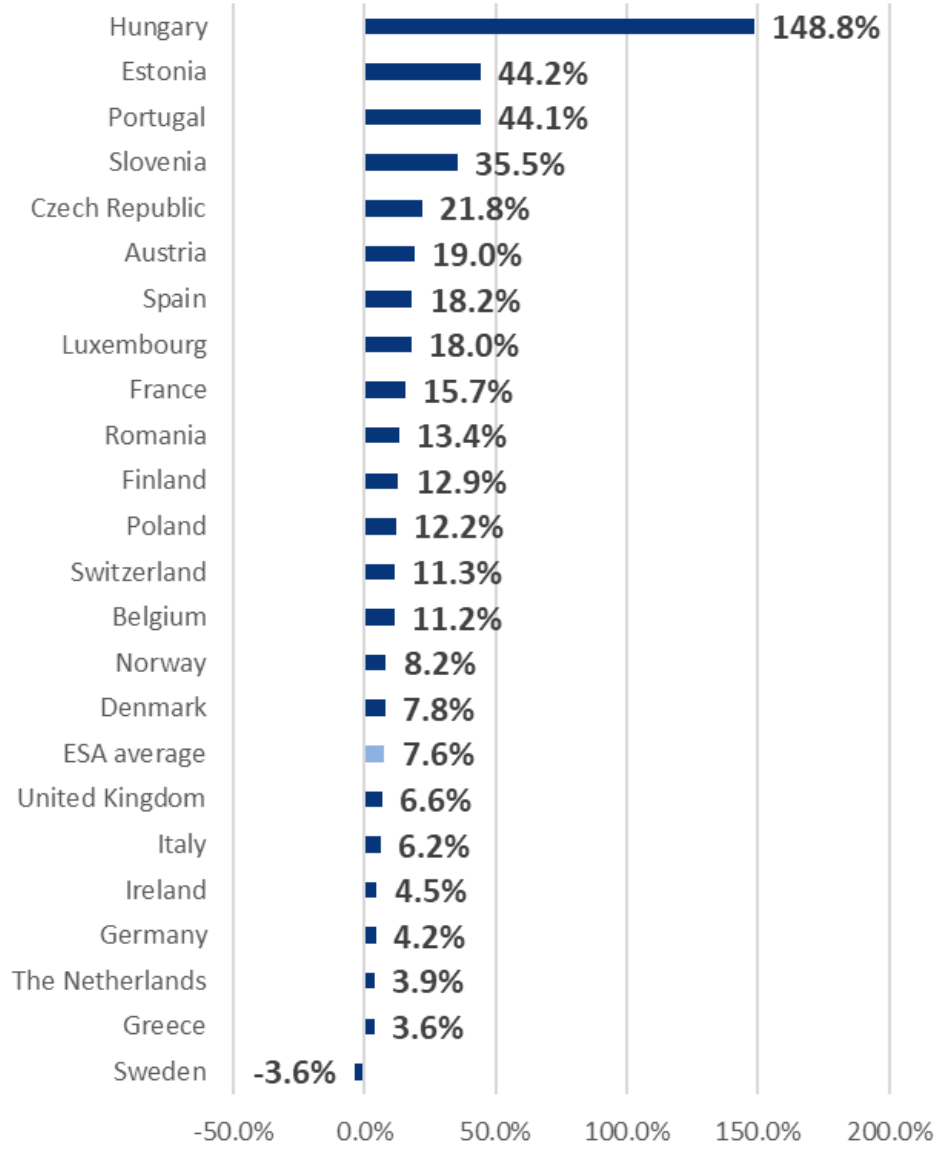
Growth of NewSpace EO turnover (2013-18)



NewSpace EO turnover growth (CAGR 2013-18), by Member State

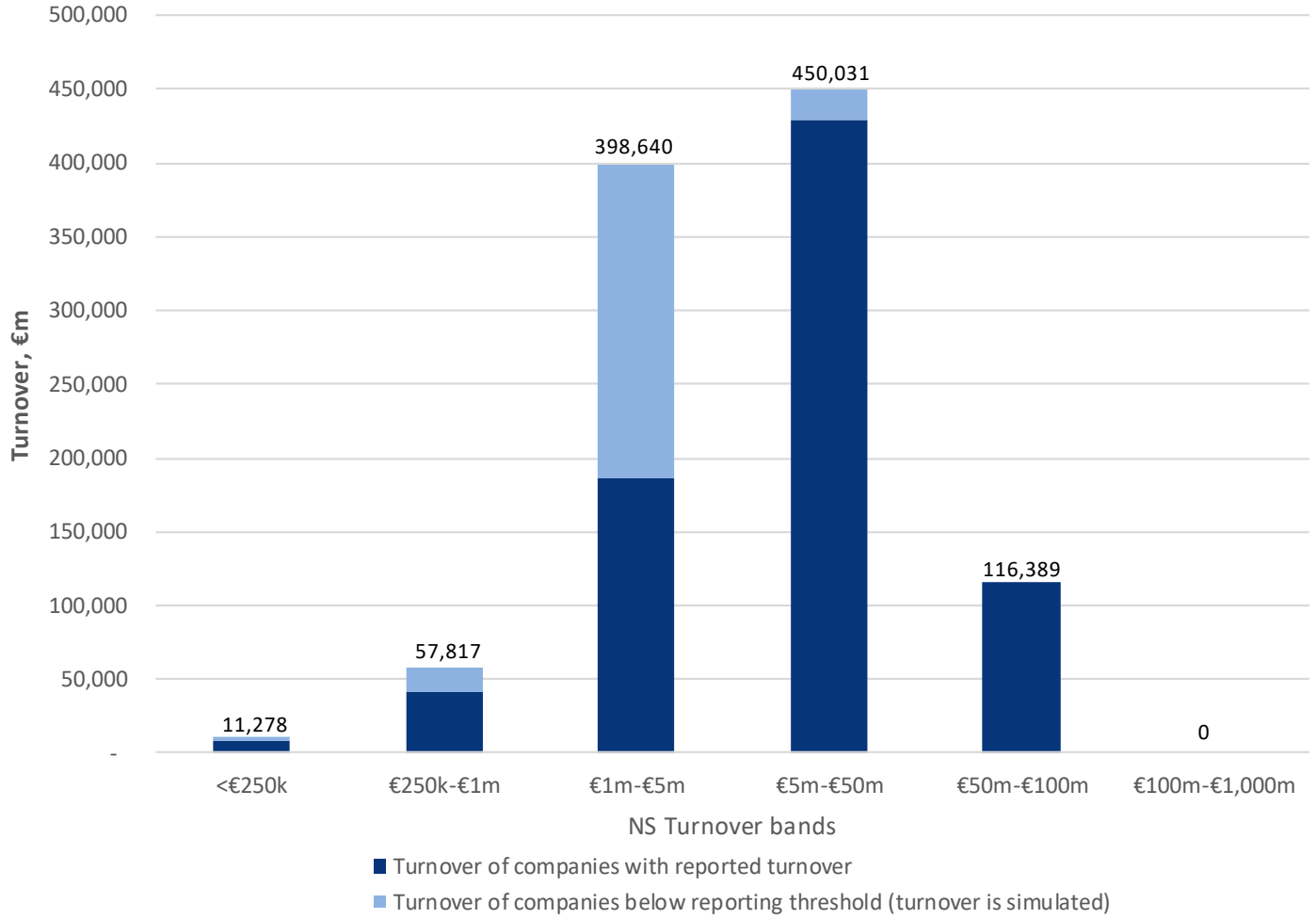


NewSpace growth of turnover



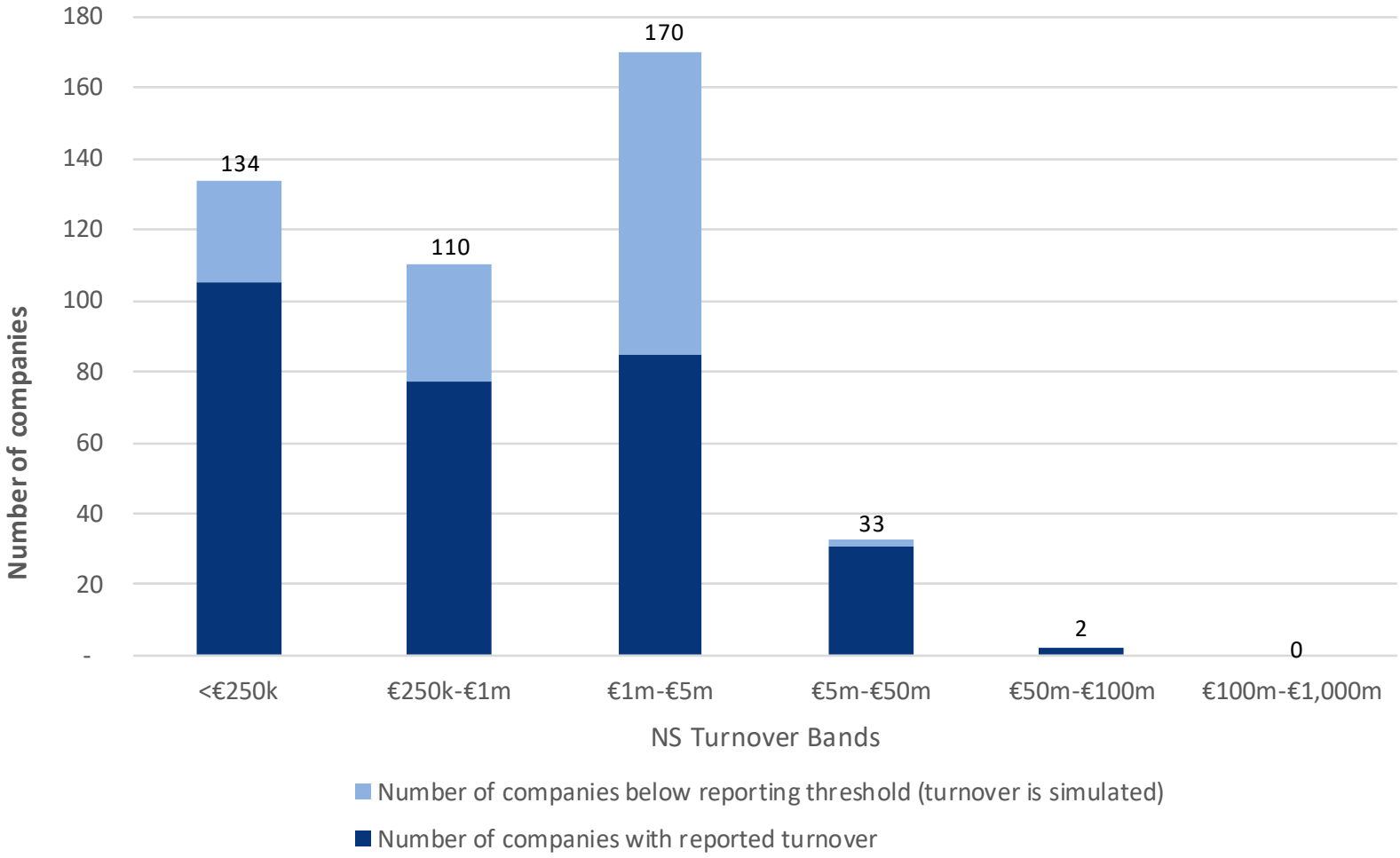
Commercial NewSpace EO turnover (2018), by turnover band

The majority of NewSpace EO turnover (75%) is accounted for by companies that report turnover. A minority of NewSpace EO turnover (25%) is accounted for by companies that do not report it. This is the case for small companies below the statutory reporting threshold for annual accounts. Turnover is simulated for these companies based on empirical rules (see methodology).

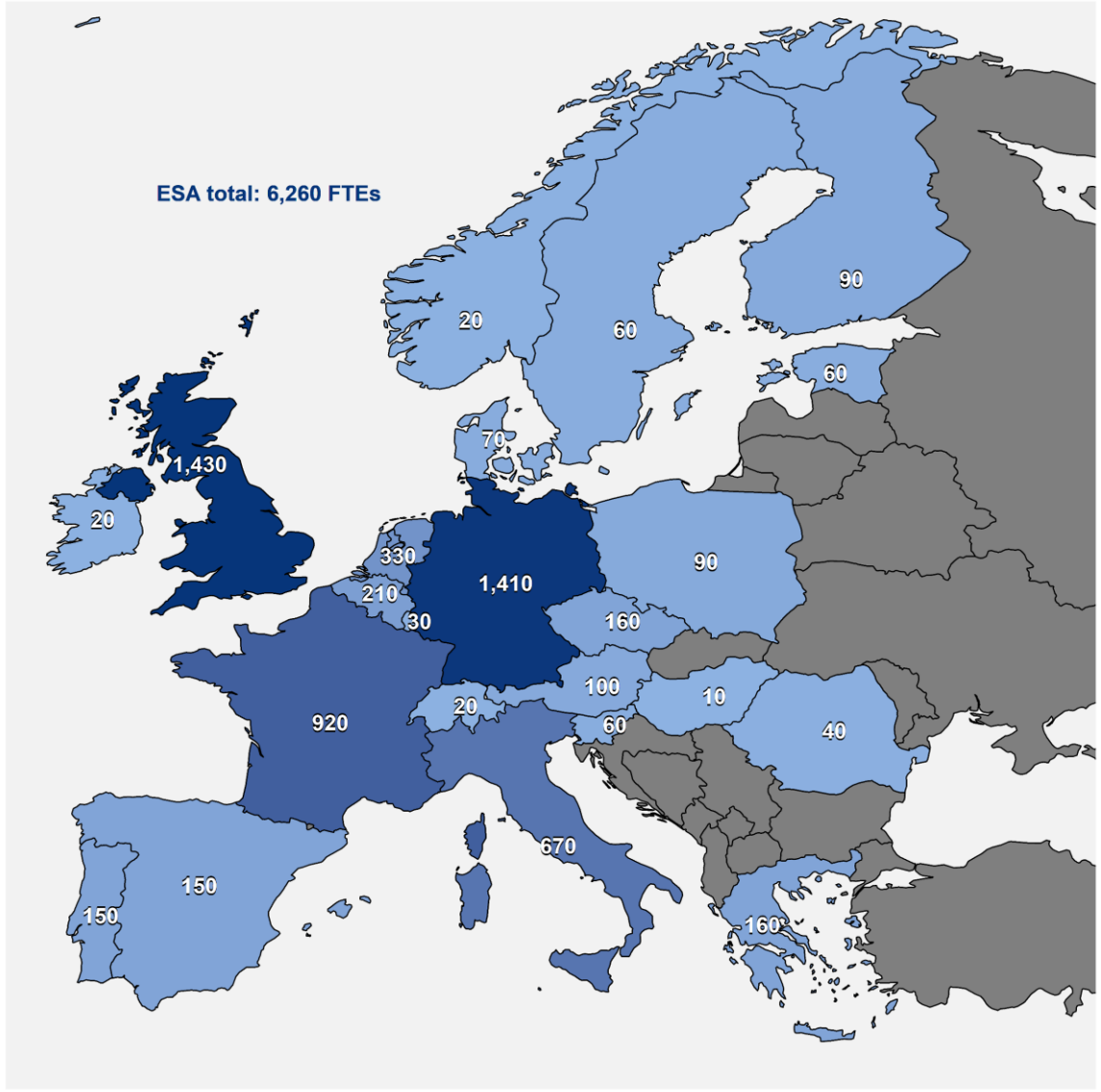


Number of NewSpace EO companies (2018), by turnover band

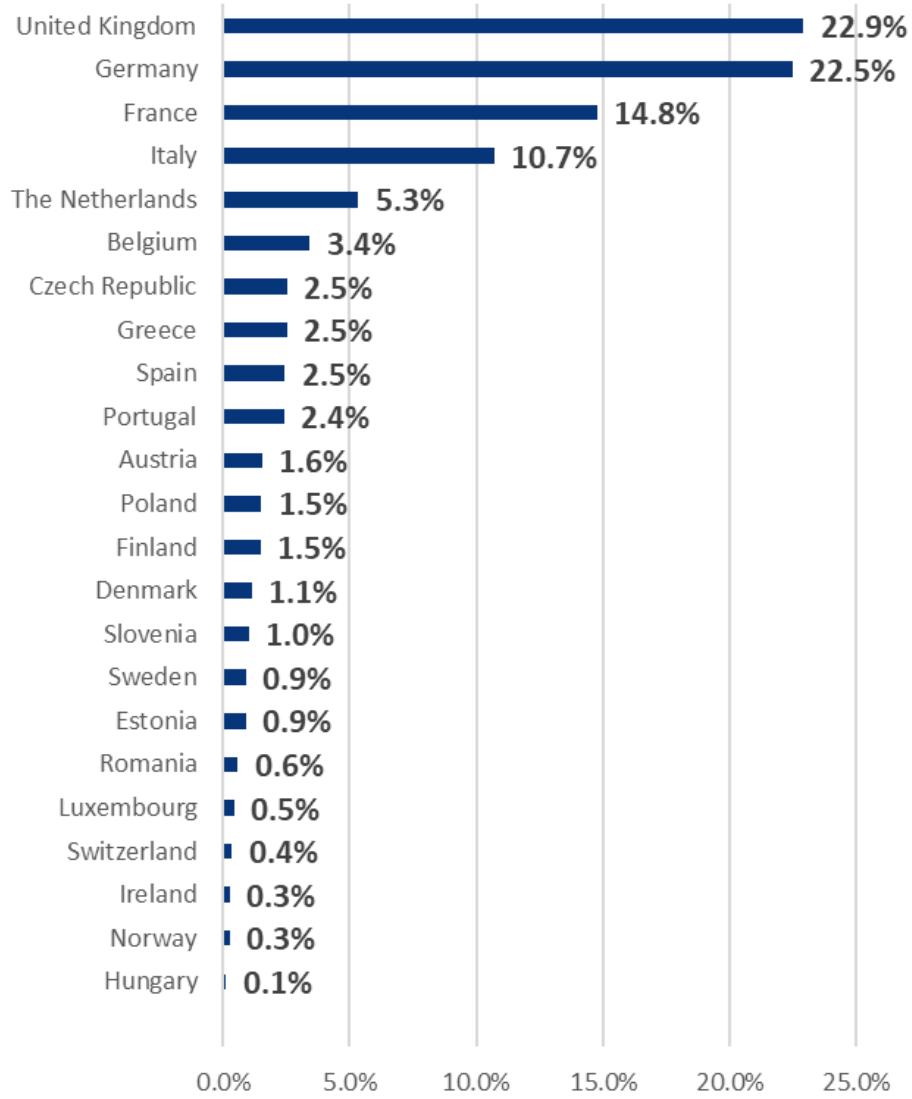
Most NewSpace EO companies (300) report turnover. A minority of companies (149) do not report turnover. This is the case for small companies below the statutory reporting threshold for annual accounts. Turnover is simulated for these companies based on empirical rules (see methodology).



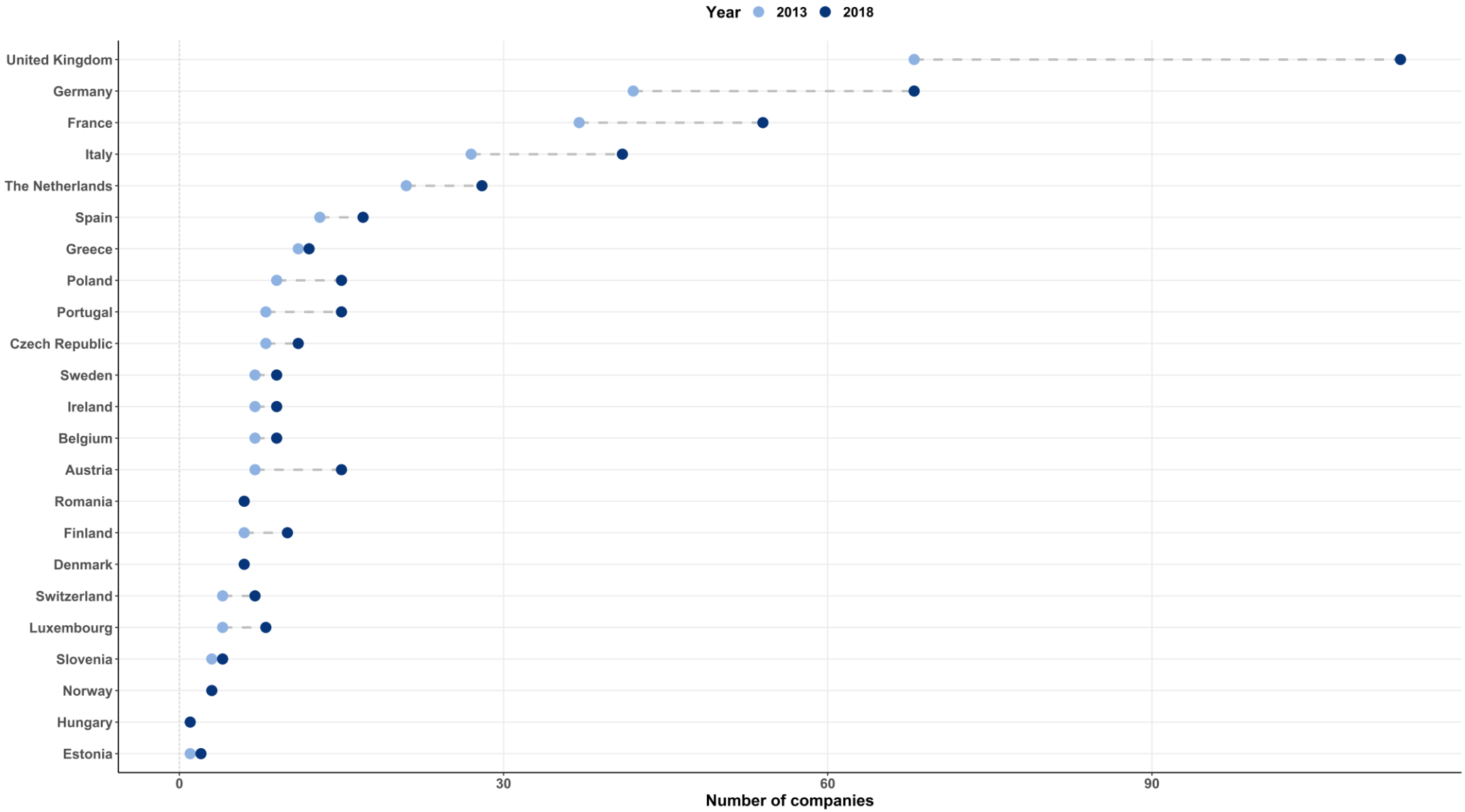
NewSpace EO employment (FTEs) in 2018, by Member State



NewSpace employment market shares



Number of commercial NewSpace companies in 2013 and 2018



Largest NewSpace EO companies in Europe (turnover), 2018

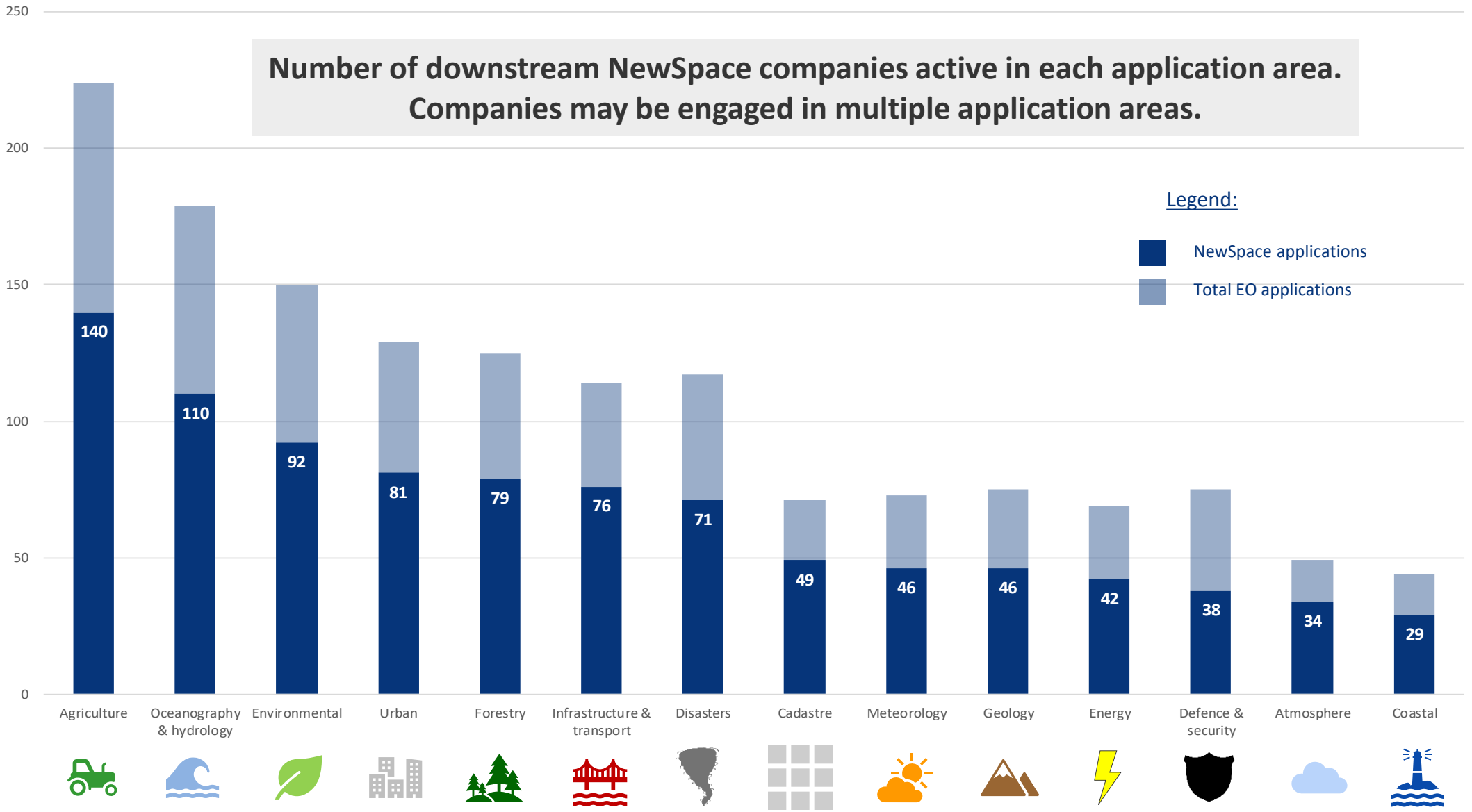
1	Tesat-Spacecom	
2	E Geos	
3	Oracle	
4	Flemish Institute For Technological Research	
5	European Space Imaging	
6	Jena-Optronik	
7	Surrey Satellite Technology Limited	
8	GAF AG	
9	Magellium	
10	Engineering Ingegneria Informa	

11	Exprivia	
12	Esri Deutschland	
13	Spacetech	
14	Fugro	
15	Nexeya	
16	ACRI Group	
17	Geosys	
18	IABG	
19	Planet	
20	Bertin Technologies	

Largest NewSpace EO companies (turnover) in 2018, by value chain

Upstream Manufacture of satellites and instruments		Midstream Data acquisition and storage and distribution		Downstream Data processing, analysis and insight	
Jena-Optronik Gmbh		Tesat-Spacecom		Oracle	
Surrey Satellite Technology Limited		European Space Imaging		E Geos	
Tesat-Spacecom		E Geos		Flemish Institute For Technological Research	
Nexeya		GAF AG		Magellium	
Bertin Technologies		Space Hellas		Esri Deutschland	
Qinetiq		Planet		Engineering Ingegneria Informa	
S&AO		Geosys		Fugro	
Stmicroelectronics Srl		CGI Deutschland		Acri Group	
Qinetiq Space Nv		Digital Globe		European Space Imaging	
Konzept Informationssysteme		IABG		GAF AG	

Number of companies active in downstream applications, 2018



Summary of size and growth of NewSpace EO in 2018 (Europe) (1/2)

- The total NewSpace economy was worth **€1.0bn** in 2018 or 33% of the total EO market.
- **450** registered organisations (56% of all EO organisations) are classified as commercial NewSpace organisations.
- At **€274m**, Germany has the largest market share (26.5%). This is followed by the United Kingdom (**€185m** or 16.9%) and France (**€146m** or 14.1%).
- The market is highly concentrated: together with Italy, the 4 leading nations share **69.9%** of the total NewSpace EO market.
- On average, the NewSpace EO economy has grown by **7.6%** per annum since 2013. This is **4.5 times** the EO market growth over the same period. Hungary, Estonia, Portugal and Slovenia have the largest growth rate among ESA Member States at **more than 35%** per annum between 2013 and 2018.
- All segments of the NewSpace EO market have grown, in contrast to the trends in the global EO market. The downstream segment leads with a **10.3%** annual growth rate, followed by midstream (**4.2%**) and the upstream (**3.9%**).

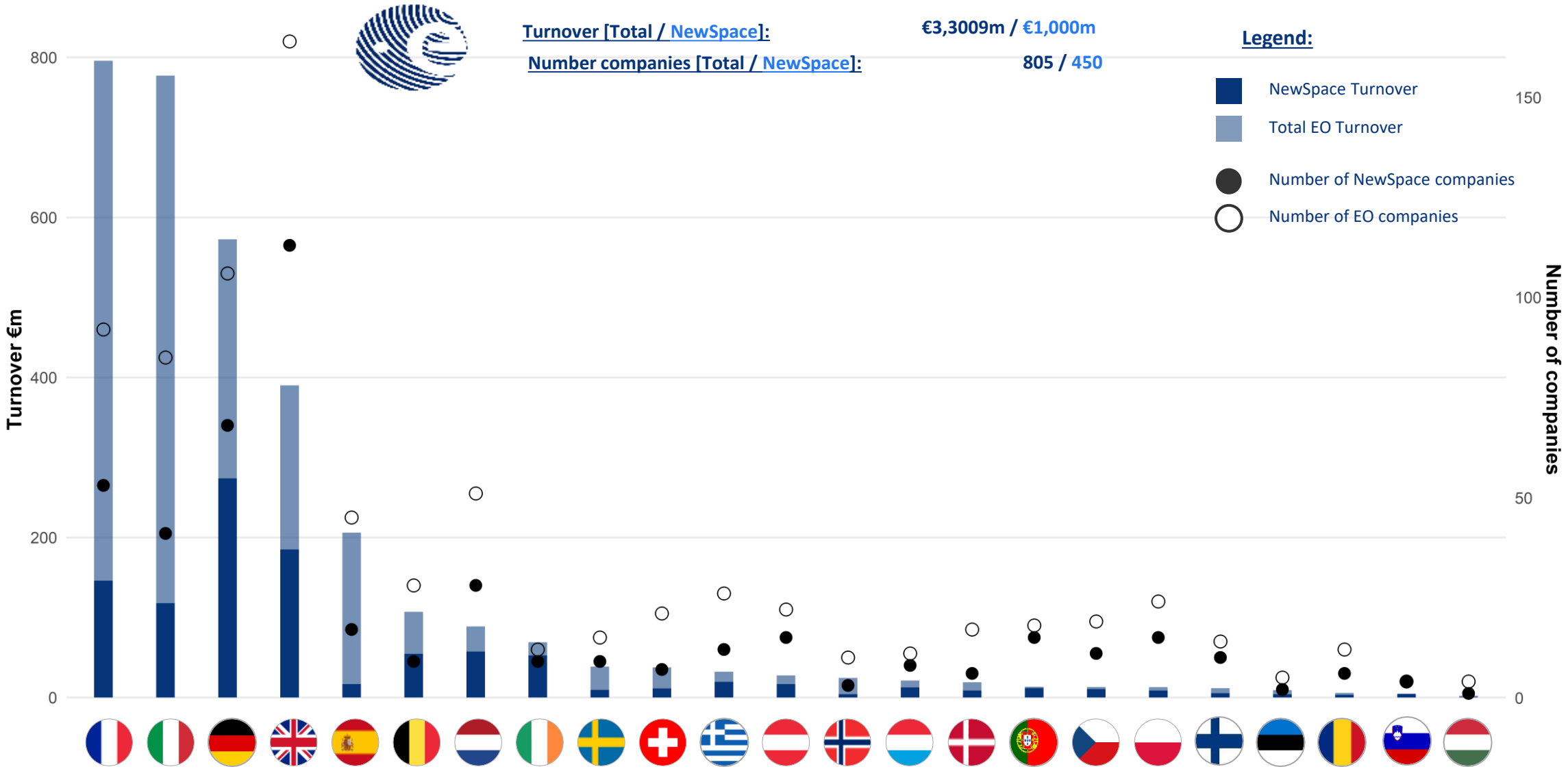
Summary of size and growth of NewSpace EO in 2018 (Europe) (2/2)

- NewSpace EO organisations in Europe employ nearly **39%** (6,260 FTEs) of all employees in EO market in 2018.
- The UK is the largest employer with **22.9%** followed by Germany (**22.5%**) and France (**14.8%**). Together, these countries account for nearly 6-out-of-10 of the NewSpace EO employment in ESA Member States.
- In the UK, **113** companies were active in the NewSpace EO industry in 2018 (up from 68 in 2013). With **68** companies in 2018, Germany added **26** new companies since 2013. Portugal, Poland and Austria standout, having all doubled the number of active companies in 5 years.
- This list of leading NewSpace EO companies is much more diverse than the corresponding list of leading EO companies.
- Agriculture, oceanography & hydrology, and environmental applications have the greatest number of active NewSpace EO organisations.

Comparison of EO and NewSpace market assessment (Europe)

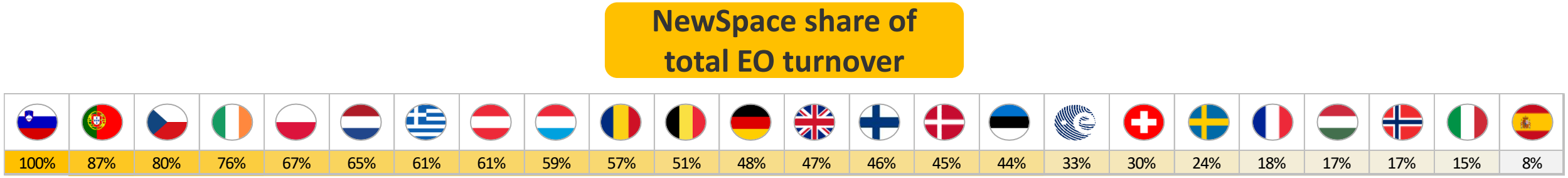
- Turnover (2018 prices)
- Employment (full time equivalent)
- Market share
- Leading companies
- Summary

Commercial EO market in 2018, by Member State



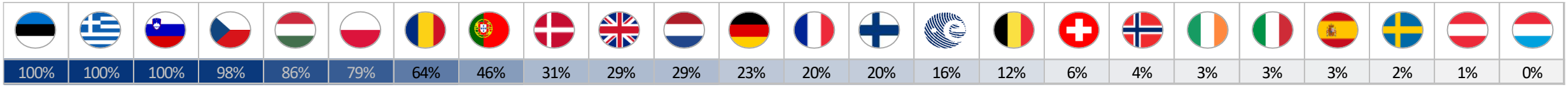
NewSpace share of total EO turnover (2018)

The charts on the next two slides show the proportion of total EO turnover that is classified as NewSpace for each country and the total average for the 23 countries in this analysis (ESA average).

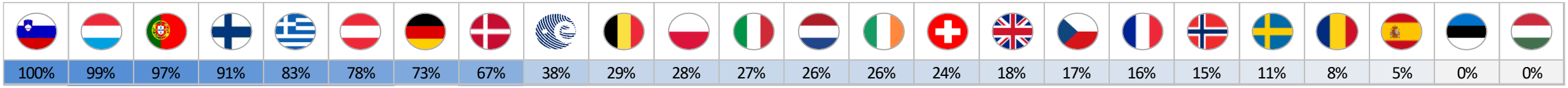


NewSpace share of total EO turnover (2018), by segment

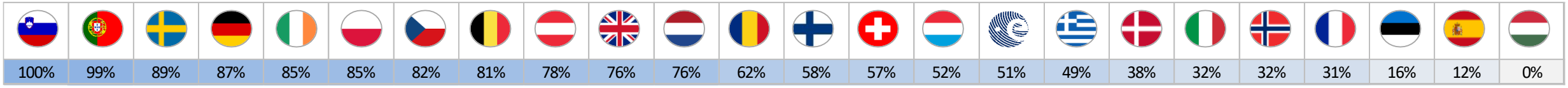
Upstream



Midstream



Downstream



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  - ESA in expediting access to ESA's databases;
  - Member State delegates in providing internal databases of companies, reviewing initial lists of companies and offering suggestions;
  - London Economics' three summer Research Assistants: Jule Hodok, Carolyn Visser and Ranea Saad

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