



Development of the Guarantees of Origin
Market (2009-2014)
– Key Facts Report



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1. ABOUT THIS REPORT

This report was written by Grexel® on request of RECS International and it brings an outlook of the Guarantee of Origin Market between 2009 and 2014. The analysis considers renewable electricity production volumes, issuing and cancellation volumes of Guarantees of Origin, production non –eligible for certification due to support schemes (e.g. Feed-in tariffs) and analyses how these variables have changed during the period in question.

30 European countries were selected for this analysis: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

The electricity production and consumption data came from detailed monthly production statistics from ENTSO-E¹. EECS issuing and cancellation figures are from AIB's statistics². In addition, national GO figures were collected from countries' national GO market reports, national contacts and from RE-DISS's country profiles³ or, where not easily available, the national figures were estimated. Finally, renewable volumes non-eligible for certification came from local energy authorities' reports.

Assumptions and estimations:

- Missing RE production periods in ENTSO-E data were estimated by extrapolating previous values.
- Missing issuing and cancellations figures in the AIB statistics were also estimated taking into account previous volumes.
- Where the data is poorly available for National GOs' issuing and cancellation volumes, assumptions were made based on available information and knowledge. Still, this report does not bring information on possible national GO statistics that might exist in Bulgaria, Greece, Latvia, Lithuania, Poland, Romania, Slovakia and Portugal.

¹ Source: <https://www.entsoe.eu/db-query/production/monthly-production-for-a-specific-country>

² Source: http://www.aib-net.org/portal/page/portal/AIB_HOME/FACTS/Market%20Information/Statistics. Note: Issuing volumes came from production data and cancellation volumes from transaction data.

³ Source: <http://www.reliable-disclosure.org/documents/>

2. OVERALL MARKET DEVELOPMENT

The figure below looks at issuing volumes, which consider both EECS-GO and national GOs issuing, non-eligible production and the rest of the renewable production (Available), between 2009 and 2014. Cancellation volumes were also taken into account and, as volumes for issuing, cancellation volumes refer to both EECS-GO cancellations and national GO cancellations.

- In 2014, the market achieved its record in terms of cancellations: 492TWh of certified electricity, an 18% increase from 2013. On the other hand, issuing volumes decreased in 2014 by 3% (from 510 TWh to 493 TWh), after achieving a peak in 2013.
- In certain countries⁴, renewable energy support scheme (e.g. Feed-in tariff) is linked to the disclosure system so that supported volumes are statistically allocated to disclosure. This volume is thus non-eligible for GO issuing and marked as RES Not Eligible in the figure below. The non-eligible volume grew by 7% in the last year (from 173TWh in 2013 to 186TWh in 2014).
- The increase in cancellations together with the decrease in issuing volumes, created in 2014 for the first time since 2011 a balance of demand and supply.
- When comparing production, issuing and non-available figures, there still seem to be a fair share of idle capacity. In 2014, 350TWh is still available for certification (34% of total RE production). It should be noted however that this includes also non-EECS countries.

Regarding volumes for 2014, it needs to be noted that inaccuracies still reside especially for Q4 EECS Statistics.

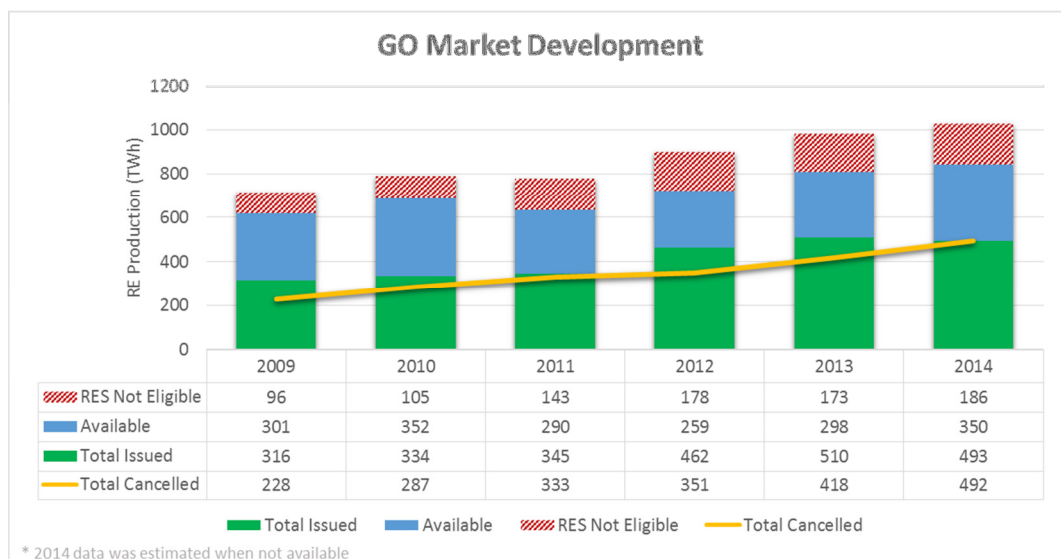


Figure 2.1 – GO Market Development

⁴ Not all countries that have a support policy in place exclude supported production from GO certification. It is this report’s knowledge that, from the countries analyzed, only France, Germany, Ireland and Portugal have such practice.

The Compound Annual Growth Rate (CAGR) between 2009 and 2013⁵ brings an interesting perspective.

- Between 2009 and 2013, RE production grew by 8,2%, issuing by 12,7%, non-eligible production by 16% and cancellations by 16,4%, annually.

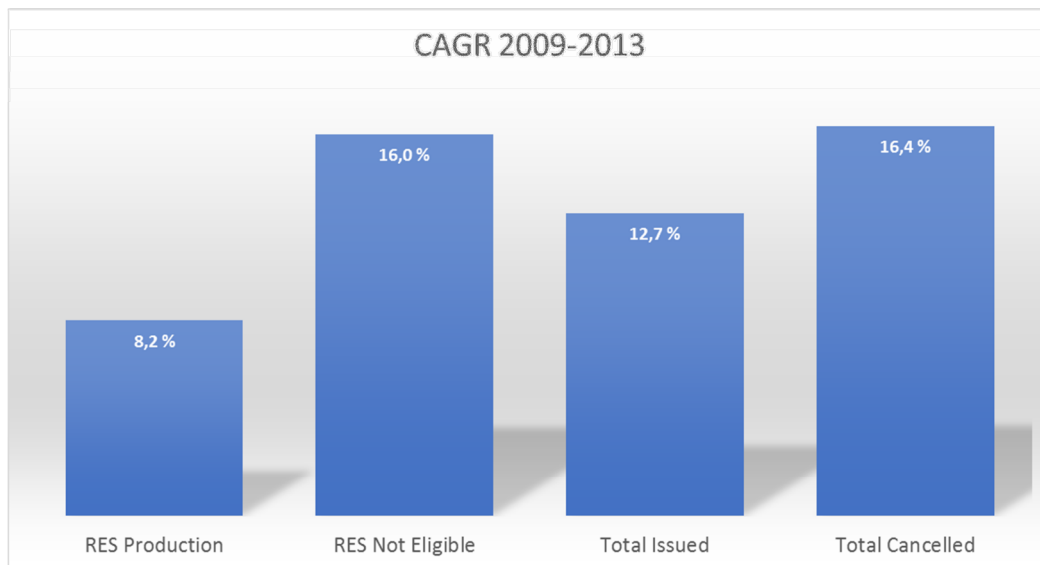


Figure 2.2 – Compound Annual Growth Rate (2009-2013)

Based on the compound annual growth rates above, the different values are extrapolated⁶ from 2013 to 2020. This simple extrapolation shows that, at current path, issuing and cancellations grow significantly faster than RE production and thus “Available” volume would become inexistent in 2020. However, the forecast below does not consider developments in the regulative setting (e.g. on RE support schemes). Therefore large uncertainty resides especially in the volume of non-eligible production as well as in total renewable electricity generation.

⁵ It was chosen to exclude 2014 from the CAGR calculation since 2014 variables relied on assumptions and estimation for several countries

⁶ The forecast was done by extrapolating the 2009- 2013 values for the future using the CAGR as growth rate. The forecast can be improved in a future study.

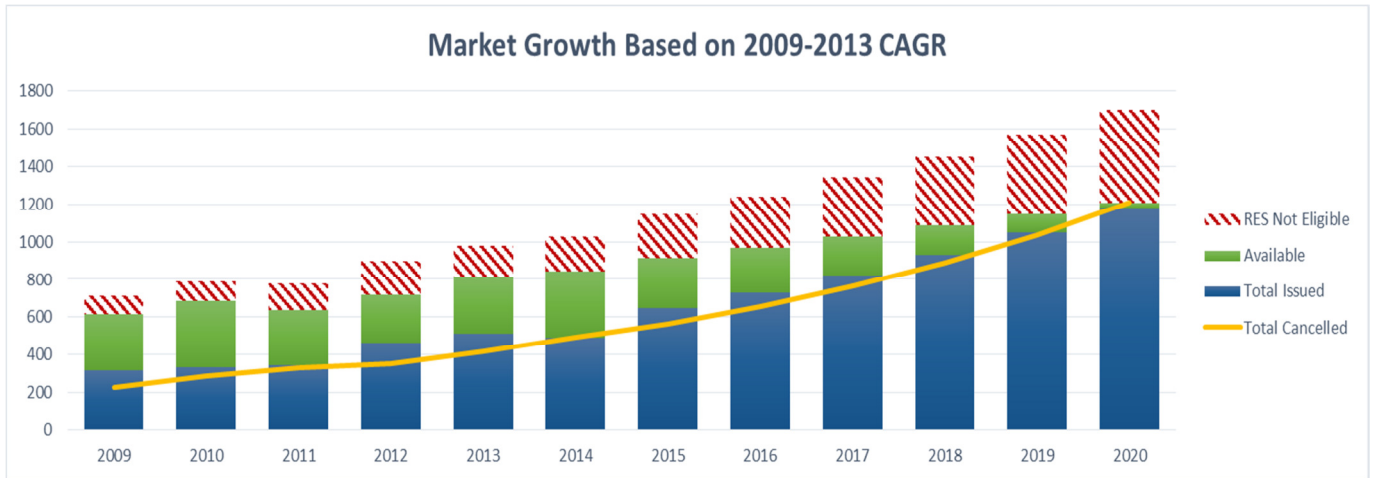


Figure 2.3 – Forecasted Market Growth

3. CONSUMPTION FIGURES

The graph below (Figure 3.1) compares production and consumption figures (left bar and right bar, respectively). It is important to note that on the supply side, remaining potential is represented by the blue bar (RE production eligible and non-issued) whereas on the demand side remaining potential equals the whole light grey bar (uncertified consumption). Naturally, actual demand can never pass supply (as a cancelled GO needs to be issued), but the graph clearly shows that there is a shortage of supply potential compared to the overall demand potential.

- In 2013, for example, 1% of the uncertified consumption correspond to 10% of the renewable production available for certification.

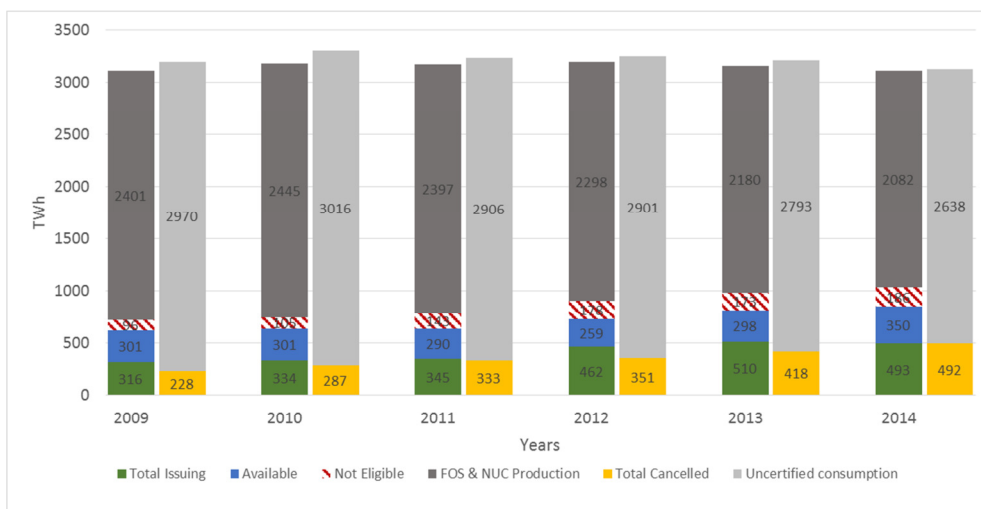


Figure 3.1 – Production vs Consumption

4. COUNTRIES OUTLOOK

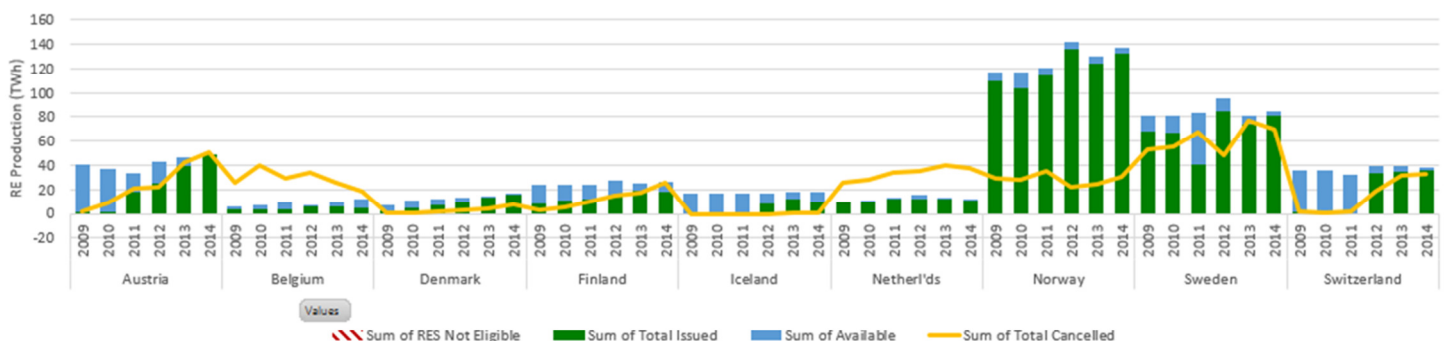
Analysing the development by country it is possible to divide the countries into four groups: 1) High GO market penetration countries, 2) Large countries with low issuance, 3) Potential newcomers and 4) Small newcomers.

4.1 HIGH GO MARKET PENETRATION COUNTRIES

This group contains countries where a high share of the RE production is already issued and the Guarantees of Origin market is well established.

These countries are Austria, Belgium, Denmark, Finland, Iceland, Netherlands, Norway, Sweden and Switzerland

- Among the countries in this group, Norway stands out with high RE production (only second to Germany). From its renewable production, 96,6% is issued a GO. The corresponding percentage is roughly the same in Austria and Sweden, which are also both significant RE producers.
- It is notable that the cancellation volumes in the countries of this group are high compared to issuing volumes (apart from Iceland and Norway). This means that the home market demand is strong in well-established GO markets
- In this group, no RE production is non-eligible for issuance of GOs due to support schemes



* 2014 data was estimated when not available

Figure 4.1 – High GO Market Penetration countries

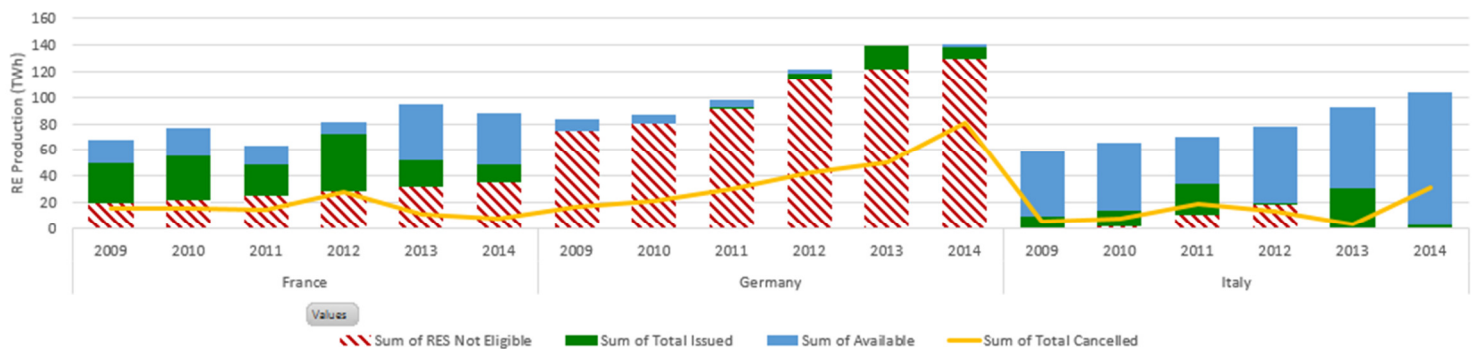
4.2 LARGE COUNTRIES WITH LOW ISSUANCE

This group contains countries where a GO scheme is established, but a low share of RE production is issued. Some of these countries have a particularity that a part of their renewable production is not available for certification because it receives support (e.g. Feed-in tariffs).

These countries are France, Germany, and Italy.

- All three countries in this group have high RE production. Germany, Italy and France are among the five largest RE producers in Europe in 2014.

- At the same time, a high share of these countries' renewable production is not issued a GO which, especially in Germany (and to lesser extent in France), is due to the legislation preventing supported production from receiving GOs.
- In Germany, home market demand is high and, due to the restriction in GO issuance, this demand has to be largely met with foreign GOs.
- The Italian disclosure system underwent significant changes in late 2013, which had a clearly positive effect on GO demand in 2014.
- The French situation is similar to Italy. Changes occurred in 2013 and it is not yet clear how the market will react. Both Italy and France have a large share of available production, which doesn't currently receive GOs.



* 2014 data was estimated when not available

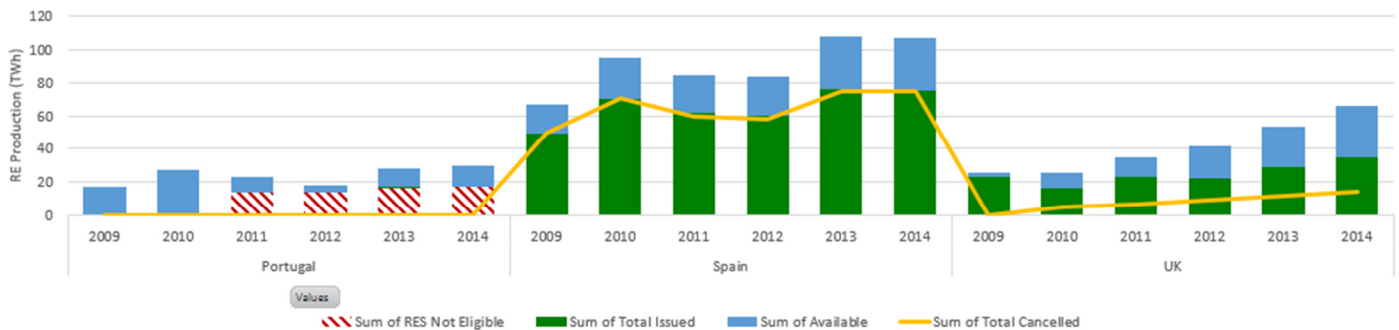
Figure 4.2 – High Available Volume countries

4.3 POTENTIAL NEWCOMERS

This group includes countries with a relatively high RE production that might cause a shift in the EECS market if/when they join AIB.

These countries are Portugal, Spain and United Kingdom.

- In 2014, Spain was the third largest RE producer in Europe. At the same time, the country has close to 75% of its RE production issued. Note that all GOs issued in Spain are assumed as cancelled; because Spanish electricity disclosure legislation does not require a cancellation of GO for use in supplier fuel mix (the supplier simply has to hold the GO in its account on the disclosure deadline 31.3.). Therefore, all GOs in the Spanish registry are used for disclosure.
- Renewable generation in UK has been growing rapidly and, should the country link its system with the AIB, a large amount of new supply and demand would enter the EECS market.
- Despite being a member of the AIB for several years, Portugal has still not implemented EECS-GOs (small EECS volumes come from existing RECS certificates). RE production is significant (10th in Europe), although large part of the production is non-eligible due to the feed-in tariff.



* 2014 data was estimated when not available

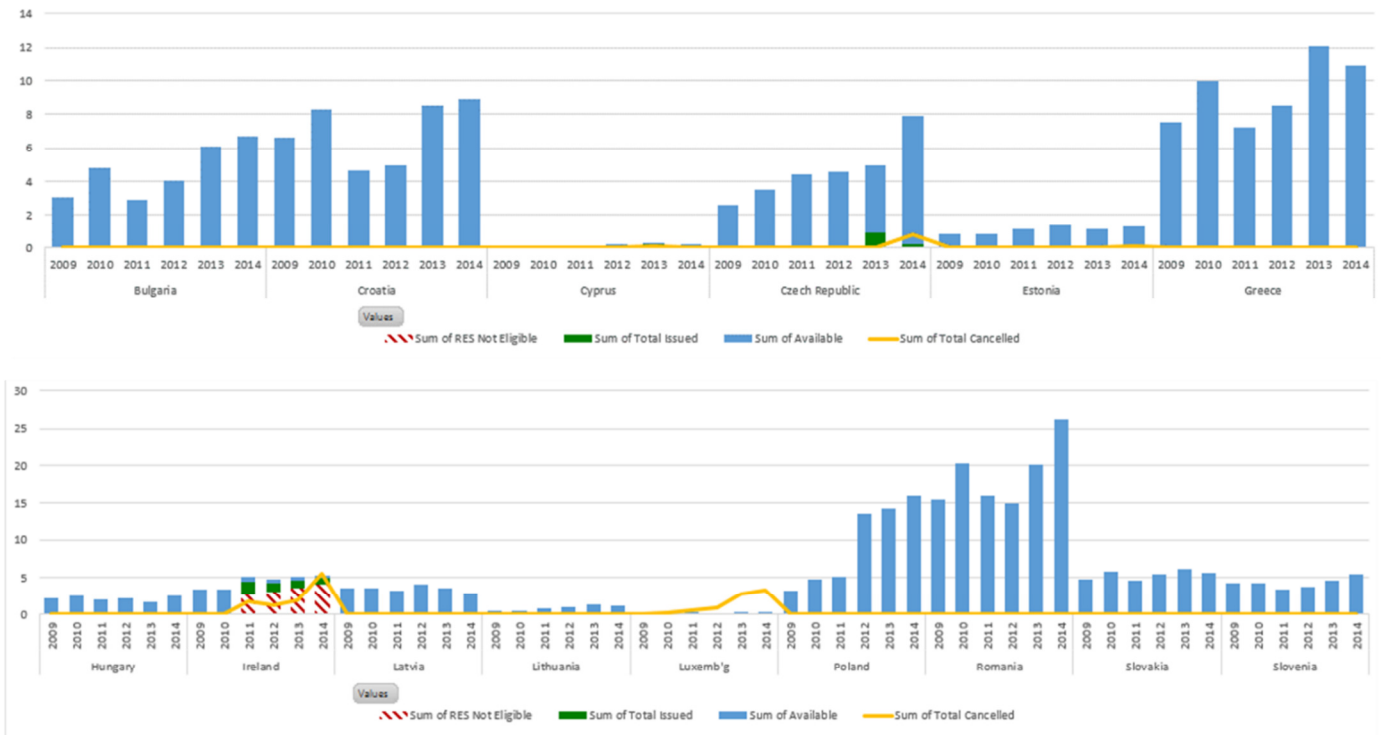
Figure 4.3 – Potential newcomers

4.4 SMALL NEWCOMERS

This group includes countries that are already part of the EECS market or are joining it, but have relatively low renewable production.

These countries are Cyprus, Czech Republic, Estonia, Hungary, Ireland, Luxembourg, Slovenia, Croatia, Bulgaria, Greece, Latvia, Lithuania, Poland, Romania and Slovakia.

- Together, these countries accounted for 101TWh of renewable production in 2014, which roughly equals Italy’s RE production of that year.
- Czech Republic, Croatia, Estonia, Luxembourg and Slovenia are members of the AIB and therefore part of the EECS market already.
- This report has no information of existing certificate schemes in Bulgaria, Greece, Latvia, Lithuania, Poland, Romania or Slovakia.
- Cancellations are very low or inexistent in this group with the exception of Luxembourg and Ireland. This might be resulting from infrastructure for GOs and electricity disclosure not being fully set up or being implemented only recently.



* 2014 data was estimated when not available

Figure 4.4 – Small newcomers