

# FMO

Entrepreneuria  
Development  
Bank

## Joint Impact Model

Application by FMO

Impact Measurement and Integrated Reporting

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# 1. Introduction

## 1.1 Objective

One of FMO's core values is to be **transparent and build trust**. The objective of this document is to describe the way FMO has implemented the Joint Impact Model (JIM) and thereby be as transparent as possible on how we estimate and report the indirect impacts of our investments. Although many institutions are now using the same Joint Impact Model methodology, the application thereof can lead to different outcomes.

With the help of this document and related documentation, the readers of our Annual Report 2020 are informed on the indicators that are reported with the JIM (chapter 1), a summary of the JIM and its limitations (chapter 2), how we report in the Annual Report (chapter 3) and how we gather the inputs of the JIM (chapter 4). We also proudly present our activities to make the JIM **open access** to impact investors across the globe (chapter 5).

This document is an explanation of the "JIM application by FMO" while the methodology of the JIM itself is described in full detail in the [JIM Methodology](#) document written by Steward Redqueen.

## 1.2 Indicators

At FMO, the JIM is used for **reporting purposes at portfolio level**, meaning it is based on clients that are in our portfolio at the time of reporting (December 31<sup>st</sup> 2020) and have an outstanding amount in our balance sheet. It estimates the effects of these investments on *Jobs supported* and *Financed absolute GHG emissions*:

- *Jobs supported*— The number jobs supported provides a proxy of the spill-over effect of investing in the private sector. As businesses survive and grow, their outputs require direct employment and intermediary inputs. This in turn leads to activity among existing and new suppliers, thereby supporting and creating jobs. Some products and services – notably electricity, infrastructure and finance – remove constraints for other businesses, enabling them to succeed and hopefully to expand. For indirect jobs, the first results were published in the Semi-Annual Report 2020 together with a [news article](#) explaining the difference in the assumptions between the old and new model.
- *Financed absolute GHG emissions*— As per the Annual Report 2020, the JIM also provides the carbon footprint of our clients. Based on macro-economic statistics, the JIM estimate absolute emissions from our clients in case primary client emission data is not available.

## 1.3 Related documentation

As stated, the current document is narrowed to the JIM application by FMO. The following documentation is also available related to the JIM:

- [JIM Methodology](#) written by Steward Redqueen - This document includes a detailed overview of the methodology, data sources and calculations used in the JIM. The document describes the methodologies applied for each impact – i.e. supply chain and induced, direct, financing enabling and power enabling impacts as well as key assumptions and limitations.
- [JIM User Guide](#) - The purpose of the User Guide is to assist users to run the JIM on their portfolio of investments. It provides guidance on how to use the input template. Moreover, you will find instructions on how to access the online Interface, read the input error messages and use the Results Excel file.
- [JIM Input Sheet](#) - Template for the JIM with examples of various inputs for different clients and optional inputs.

Other information such as the Frequently Asked Questions (FAQs) and webinars that were recorded are also available on the [website](#).

FMO also makes available the [JIM Methodology](#) written by Steward Redqueen under “how we measure impact” on its [website](#).

## 2. Application

### 2.1 High-level summary of the JIM application by FMO

The theory of change behind the indirect jobs ([JIM Methodology](#) written by Steward Redqueen) is as follows: a financial investment allows a business to grow. The additional output requires more **jobs supported**. The same applies for **Financed absolute GHG emissions**. This in turn leads to expansion among existing and new suppliers, thereby supporting and/or creating jobs, as well as producing emissions. Some products and services – notably electricity and finance - remove constraints for other businesses, enabling them also to expand and again support and/or create jobs. In emerging markets, firm expansion the JIM assumes not to displace employment in competing businesses to a significant extent.

The JIM application by FMO splits the results of **jobs supported** in the following categories:

- **Backward Temporary** – Temporary projects are operating for a limited period of time and do not have annual sales. An example are power projects that are in the construction phase and temporary public sector projects. To estimate the impacts in one particular year, the project value should be an annualised amount, equal to the project spending in the fiscal year provided. If the full project amount is inserted, the impacts quantified reflect the impact over the project's lifetime, assuming constant labour productivity, and no changes to the production structure of suppliers.
- **Supply chain jobs** – Jobs that are created within the investee's direct and indirect suppliers following the investments are called supply chain jobs. Supply chain expenditure is based on procurement. The domestic procurement is routed through the Social Accounting Matrix (SAM) to calculate the output generated at its direct suppliers and their suppliers. These outputs are multiplied by the relevant sector-specific employment intensities to estimate the jobs in the supply chain.
- **Induced jobs** – Induced jobs arise due to the spending of wages earned by employees of the investee and its direct and indirect suppliers. The JIM takes client data on actual wages paid in the business and prevailing wages earned in the relevant sectors of the supply chain and routes these through the SAM to determine where wages are spent. Multiplying the output by the applicable sector-specific employment multipliers gives an estimate of the jobs resulting from the spending of wages.
- **Finance Enabling** - Economy-wide jobs via financial services. Any employment that takes place at the client level of a financial intermediary (e.g. a bank in Nigeria) is estimated by the JIM. Finance enabling jobs arise due to lending to businesses and individuals of the financial intermediary. There is strong evidence of the relationship between bank credit and employment in borrowing firms from natural experiments resulting from the financial crisis.
- **Power Enabling** - Economy-wide jobs via power generation. Indirect jobs can also arise due to the economic activity generated by the supply of electricity to businesses. The JIM calculates the amount of GDP attributable to an increase in gigawatt hours (GWh) of electricity supplied to the national system. The resulting additional GDP is then allocated by sector according to the prevailing economic structure of the host country. Because power generators tend to operate at maximum efficiency, the model tends to show large numbers of jobs supported at the start but little incremental change between years until new capacity is added.

The JIM application by FMO splits the results of **Financed absolute GHG emissions** in the following categories:

- **Scope 1** – direct emissions from owned or controlled sources. This is related to direct emissions from the client.
- **Scope 2** – indirect emissions from the generation of purchased energy. This is Supply chain GHG emissions related to the client's direct electricity supplier.

- *Scope 3* – all indirect emissions (not included in Scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions. Supply chain GHG emissions other than the emissions related to the client’s direct electricity supplier.

## 2.2 Assumptions and limitations

JIM allows quantifying the wider impact of investing in various economic regions and sectors, both directly and through financial institutions and funds. The JIM is an economic input-output model, which is a widely recognized academic method to depict inter-linkages between sectors, which enables the model to trace product and money flows through an economy. However, it is also important to point out the assumptions and limitations of the JIM. FMO encourages its readers to take these into account when reading and interpreting the results.

An important methodological assumptions on this model which fundamentally changes the result, is running the model at portfolio level (meaning taking a snapshot of all clients of FMO at the time of reporting) instead of only new commitments (meaning new commitments of FMO for a given year). Another important assumption is reporting on actual results (ex-post) instead of forecasting (ex-ante). Our focus is on what is in our current portfolio; what has already been built, and who the investees of our funds are. This means that we are no longer estimating the expected effects in the future. For example, we no longer include estimations on power plants built in the future, or funds’ future expected impact. The assumptions and limitations of this document will refer to all “ex-post” ways of measuring. Lastly, another important assumption which changes the results fundamentally is the application of attribution. At FMO we have always believed in taking the same share of financing (attribution) for positive (jobs supported) and negative (absolute financed GHG emissions) impacts. For this we are aligning with PCAF methodology. These are further discussed on section 3.1 of How We Report.

### *Supply chain and induced impact -*

IO modelling has several advantages. First, it captures direct and indirect effects in an industry-specific manner, which means the scope covers an entire economy. Second, it requires little data on the studied intervention. This makes it particularly useful in regions where data is scarce or unavailable. For regions with limited data availability, such as many developing countries, IO tables are typically the best data that is available. Lastly, the number of interventions that can be included scales up easily. However, IO modelling also has clear limitations as it depends on simplistic assumptions:

- No supply and capacity constraints: the model assumes additional output is generated regardless of the availability of resources (e.g. labour, raw materials, production capacity), which may be tied up in other activities;
- Fixed production structures: IO modelling assumes production structures are “frozen” in time. This implies no change in returns to scale and a fixed production structure with no substitution of inputs. However, business growth is likely to impact the inter-relationships between sectors within an economy (for example, through competitive changes and displacement). Because of this, results describe average, not marginal, effects;
- Fixed prices: price changes in the local economy, which could result from policy or crowding out effects, are not considered. Thus, prices do not constrain input availability. The model is therefore most accurate for projecting the impact of relatively small and short-term changes in demand. For example, increased demand for a product is assumed to imply an equal increase in production for that product. In reality, however, it may be more efficient to increase imports or divert some exports to local consumption rather than increasing local production by the full amount.
- Sector averages: IO modelling assumes that all companies in a certain sector have the same production structure. In reality, each business has a unique way of procuring its goods and services, and businesses backed by DFIs are likely to be atypical of their sectors (they may be more capital intensive, for example);
- Overstated employment intensities: imported intermediates are not separated out, which means that the backward linkages and thus the employment multipliers are not confined to the

domestic economy, and may be overstated (with this being uneven across sectors depending on how much of a sector's intermediate inputs are imported);

- No diversification of spending patterns: the model assumes that all households have the same spending pattern. However, consumption patterns of low-income households are likely to deviate from those of households with a higher income level.

Due to these assumptions the method risks some over overestimation. On the other hand, other firm level development impacts (e.g. from tax contributions, product innovations, foreign exchange savings from exports, knowledge spill overs, imports) are not accounted for, even though they likely create further impacts.

Computable General Equilibrium (CGE) modelling is theoretically more sound than IO modelling as it relies on fewer assumptions allowing it to mitigate some of the drawbacks of IO modelling: it accounts for supply side adjustments and it considers responses in investment, land supply, population and (commodity and factor) prices. This makes CGE models, in principle, capable of capturing both positive gross multiplier and negative displacement effects from external influences. As a result, CGE modelling is theoretically superior to IO modelling.

Nevertheless, there are disadvantages of using this approach. It is comparatively data intensive. To run the model, many price elasticities must be specified, which is challenging in contexts with low data availability. Moreover, CGE modelling requires intensive calibration of the model and its variables, because the number of variables in a CGE model tends to (far) outstrip the number of equations. This makes it a costly and time-consuming approach. Finally, the complexity of the interactions between variables makes interpreting, explaining and/or communicating results difficult.

Given these trade-offs, IO modelling is more appropriate for use in the JIM. CGE modelling could arguably be impracticable for investors backing multiple businesses in multiple (developing) countries. However, CGE models are available or under development in a range of developing countries, such as South Africa and India. We will explore the feasibility of implementing (elements of) CGE modelling in the future.

*Direct impacts* - Preferably, direct impacts are based on observed data only. Investors could use their direct relationship with clients to convince them to track and share these data points. This significantly increases the confidence level of results. Only when necessary, economic modelling (i.e. data filling) of direct impacts will be used. A key limitation of modelling the direct impact of clients is that the model assumes all companies in a certain sector and country have the same production structure. In reality, each business has a unique way of producing its goods and services, and businesses backed by DFIs are likely unrepresentative of their sectors (they may be more capital intensive, for example). It is recommended that investors increase the observed datapoints over time.

#### *Finance enabling impacts -*

The limitations of I-O modelling also apply to the finance enabling impacts. The FI enabling approach however uses additional assumptions, which further reduces the confidence level of results. Instead of using observed company data as input (which is the case for the direct, supply chain and induced impacts), the FI enabling impacts are based on modelled company data (using the constant capital-to-output ratio). The current approach – using a constant capital-to-output ratio for all sectors and countries to calculate changes in firm output in response to an increase in capital – was used to align assumptions with other modelling efforts.

#### *Power enabling impacts -*

There are a number of significant assumptions built into the power enabling impact calculations in the JIM, which reduces the confidence level of results. Instead of using observed company data as input (which is the case for the direct, supply chain and induced impacts), the power enabling impacts are based on modelled company data (using the constant power-to-output translation factor). The current

approach – using a constant power-to-output translation factor for all sectors and countries to calculate changes in firm output in response to an increase in power – was based on a straight average of four detailed case studies, following discussions on alignment of assumptions with IFC and others.

*Attribution* - Unlike the methodological aspects of the model - which are the same for all users of the model - institutions can opt whether or not to apply **attribution**.

Many impact investors recognise these relatively straightforward rules of prorating. However, the simplicity of the rule is also a weakness: it omits a number of relevant factors in the equation (such as the catalysing role of investors, the financial instrument, and other value adding services). Impact investors point out that prorating at best paints a simplified picture of their role, while most note that prorating alone does not adequately reflect the benefits of their intervention.

One would ideally compare the situation with an intervention to what would have happened in the absence of the intervention (the counterfactual). However, such a comparison of the situation with and without the intervention is challenging because it is not possible to observe the counterfactual situation. It needs to be constructed by the researcher, which can be a complicated and costly exercise.<sup>36</sup> An example of such studies are randomised control trials (RCTs). Although these can provide detailed insights into attribution factors for a particular intervention, it is simply not feasible to conduct RCTs for a full portfolio of investments. IFIs are working on simplified approaches to counterfactuals.

Despite its limitations, prorating seems to be a useful approach to attribute part of the impact results to an investor. In the JIM it is included as an option that can be switched on and off, depending on user preferences. In the future, we will explore further refinements of the attribution approach.

Historically FMO has championed the importance of attribution and we continue to take our “fair share” of impact by multiplying the jobs and emissions with our investments share in the company. We are still able to compare with other institutions internally and in other reports, but we believe that standing firm on attribution would help shape the industry toward that direction. At the same, we also acknowledge that there is still a debate in the industry regarding attribution and how to implement this. For example, it is unclear how to accommodate for the impact of off-balance sheet activities (e.g. guarantees).

**2.2.1 Assumptions and limitations of Data Sources** Over and above the assumptions and limitations of the model, the results of any model also depend on the **macro-economic statistics** that are used by the model. The JIM combines national statistics and client financials to derive results.

National statistics Statistics are derived from internationally recognised sources to ensure the reproducibility of results. However, statistics can still be poor in the sense that they are incomplete or lacking validity and reliability. This is a well-known problem, especially in Africa. Although the JIM uses best-available statistics, there is no guarantee that statistics are of sufficient quality. Users should be aware of these limitations and only use the JIM when no observable data is available.

*GTAP* - The Global Trade Analysis Project (GTAP) is a global database of bilateral trade patterns, production, consumption and intermediate use of commodities and services. The database uses input from a global network of institutes, researchers and policy makers conducting quantitative analysis of international policy issues. It is coordinated by the Center for Global Trade Analysis in Purdue University's Department of Agricultural Economics. Underlying the database there are several data sources that are heterogeneous in sources, methodology, base years and sectoral detail. GTAP has made major efforts since the mid-1980s to make the disparate sources comparable and present users with a consistent set of economic facts.

GTAP releases an updated dataset every 2-4 years. Once updated data is available, this will be included in the JIM. The JIM version 1.4 uses the GTAP 10 database.

On the one hand, the significant geographical and sectoral scope of the GTAP database and harmonisation efforts of GTAP make the database well-suited for economic simulation models like the JIM. Compared to other databases for IO tables such as WIOD and EORA, GTAP has the best coverage of geographies and sectors.<sup>42</sup> On the other hand, GTAP also has a few disadvantages:

- Outdated data: the reference year of GTAP is a few years off, and the original datasets in GTAP are often even further behind.



- Limited scope of environmental data: GTAP does not have datasets on water and land use for example.
- Missing individual country tables: some countries are part of a GTAP 'rest' table, which limits the reliability of results for these countries.

We keep on exploring other datasets to complement and/or replace GTAP data if they have better data available.

For more information please check page 40 of the JIM methodology written by SRQ.

ILOSTAT is the world's leading source on labour statistics. *ILOSTAT* - Hosted by the International Labour Organisation's Department of Statistics *ILOSTAT* database contains national labour force statistics as well as modelled estimates of labour market indicators worldwide. The latter are produced for countries and years for which country-reported data are unavailable using econometric models. This has resulted in a balanced panel dataset of aggregates for every year, with consistent country coverage. The JIM uses these ILO's modelled estimates.

The JIM will update the employment reference year annually.

On the one hand, the efforts of the ILO to produce harmonised indicators from country-reported microdata has greatly increased the comparability of the data, which makes the dataset well-suited for the JIM. On the other hand, the modelling reduced the reliability of the data. The quality of data may be improved by accessing microdata directly. We will further explore this (together with ILO) in the future.

For more information please check page 41 of the JIM methodology written by SRQ.

*World Bank Development Indicators Databank* - The WBDI databank is the primary World Bank collection of development indicators. They are compiled from officially recognised international sources. The data are the most current and accurate global development data available, and include national, regional and global estimates. The JIM will update the reference year of WBDI data annually. The wide coverage of the database in terms of indicators, geographies and years, makes WBDI a useful data source to complement the other JIM data sources.

For more information please check page 42 of the JIM methodology written by SRQ.

*International Energy Agency* - The IEA is an autonomous inter-governmental organisation within the OECD that provides data and analyses on energy related issues surrounding economics and international policy. It has an Energy Data Centre which provides an authoritative and comprehensive source of global energy data. The IEA collects, assesses, and disseminates energy statistics on supply and demand, compiled into energy balances. The JIM will update the reference year of IEA data annually. Whenever IEA data is unavailable, we use Energy Information Administration (EIA) For more information please check page 43 of the JIM methodology written by SRQ.

*Academic papers, reports, and other data* - In the JIM model a few assumptions are added based on academic research, and some other miscellaneous sources

In the Annex of this document, we have furthermore provided a list of generic **sensitivities** related to the model and how FMO accepts or mitigates these.

## 3. How we report

### 3.1 Annual Report 2020

As described in the first chapter, the JIM is used by FMO for reporting purposes at portfolio level and estimates the effects of our investments on **jobs** supported and **financed absolute GHG emissions**. Below we explain how these indicators are presented in the FMO Annual Report 2020.

- *On-Balance Sheet.* The indicators are reported for FMO's outstanding loan and equity portfolio, all type of clients (projects, companies and financial intermediaries) and regions, excluding clients that are exempted from Impact Cards. It does not include off-balance sheet exposures, such as guarantees. The JIM indicators are presented separately for FMO-A outstanding loan and equity portfolio and the public funds.
- *Portfolio level.* An important additional capability of this model is its ability to run at **portfolio level** instead of only at commitment, which has been the scope of the former impact model. After careful consideration and discussion with the members of the JIM initiative, it is recommended that the best application of the model is to do portfolio analysis looking backwards (ex-post). In other words, the use of the JIM provides the opportunity for FMO to no longer estimate the expected effects in the future, instead our focus is on what is in our current portfolio. For example, no results are reported for indirect impacts for power plants built in the future, or the future expected impact of an investment in a fund. Instead, we focus on what has already been built, and the underlying investee companies of the funds we invest in.
- *Split per department.* In line with the other indicators in our Annual Report, we split the results for our portfolio between our departments (Agribusiness, Food and Water, Energy, Financial Institutions, Private Equity, NL Business and Other). Others include our indirect effects for Special Operations and Partnership for Impact (P4i). If two or more departments invest in the same clients, we apply the impact figures proportional to the amount invested from each department.
- *Split per category.* It is recommended by the members of the JIM that the results of the model be split by the following categories: Finance Enabling, Power Enabling, Temporary, Supply chain, Induced jobs, and Direct. This is due to the different assumptions that are used in calculating each category, therefore each category should be treated separately.
- *Application per category.* For the advanced users of the JIM, we wanted to share our application per category in more detail here. For Employment we apply the following: (1) In our results we only consider the total figures, currently we do not disaggregate per female or youth employment. (2) Our **direct** employment only concerns corporates, operational project finance, banks or investees through funds. It does not include construction workers, people working directly at a fund, or direct employment from companies financed by banks. (3) Our **induced** employment only concerns re-spending of wages from corporates or investees through funds. It does not yet include operational projects, banks, funds themselves, or projects in the construction phase. (4) Our **supply chain** employment only concerns spending of procurement into local economy from corporates or investees through funds. It does not include operational projects, banks, funds themselves, or projects in the construction phase. (5) Our **temporary** employment only concerns spending of construction procurement into local economy from projects in construction phase. (6) Our **finance enabling** employment effects (direct, induced and supply chain) come from companies financed by banks. (7) Our **power enabling** employment effects only concern operational power projects.
- *Financed absolute GHG emissions.* For GHG absolute emissions we apply the same rule for splitting per department as described above. The scope definitions are in line with the GHG Protocol. We have applied the following rules: (1) for all results we merge CO<sub>2</sub> and Non-CO<sub>2</sub>. (2) For **Scope 1 & 2** we include emissions from corporates, operational and construction phase projects, scope 1 and 2 of investees through funds. We exclude Finance Enabling, Imported Emissions, Induced, Power Enabling, emissions at the fund itself. (3) For **Scope 3** we include

all Finance Enabling emissions and all Supply Chain emissions. We exclude Power Enabling, Induced, Imported Emissions.

- *Attribution*. FMO applies **attribution** to the indicators that follow from the JIM. The number of supported jobs and the amount of avoided GHG are attributed with FMO's financing as part of the total (productive) assets or total project size. FMO's financing includes the amount in euros that is outstanding. We match the latest available data of the client to our current outstanding amount per client.

Further information on the assumptions we have made where our data was insufficient to use all the functionalities of the JIM are described under "rules and exceptions".

## 3.2 Changes compared to Annual Report 2019

In addition to changes in the way we report in the Annual Report 2020, we would also like to point out the main **methodological** changes which are summarized below. These changes as described below follow from the harmonization activities. Therefore, you will find reference to methodologies applied by other members of the Association of European Development Finance Institutions (EDFI).

- *Finance Enabling*. The new JIM follows work done with CDC, following input from international finance institutions and other experts on the topic. The new approach combines capital outstanding, the amount invested by FIs into companies and/or projects in their portfolio, with a constant capital-to-output ratio of 1:0.35 for all sectors and countries. This ratio aligns with IFC's loans-to-output ratio, which is based on a study of 80 000 firms from the Orbis database.
- *Power Enabling*. This follows work done by Proparco, which have worked on the EDFI Power Tool, which takes case studies and triangulates expected output from power, based on parameters such as power outages and Transmission & Distribution (T&D) lines. Following this we have agreed to replace the Project Finance Multipliers for energy with Power Enabling effects and remove the Project Finance Multiplier for non-energy which was used by FMO previously. This is due to the lack of data available for non-energy projects. We are now looking at a partnership with PIDG that will allow us to dive deeper into effects of non-energy projects.
- *Attribution*. At this moment, in light of harmonisation, the attribution calculation that is implemented in the JIM is based on the earlier proposals by Platform of Carbon Accounting Financials (PCAF) and attribution approach as included in Annex 1 of the [draft technical standards](#) on ESG disclosures by the three European Supervisory Authorities (ESAs). Compared to our previous "attribution" approach this means that (i) the times 2 multiplication factor is no longer applied for equity investments and (ii) we divide our investments by total assets instead of non-current assets.

Combined, the methodological changes make the outcomes of the JIM difficult to compare with the Impact Model that was applied by FMO until the Annual Report 2019. Consequently, the number of jobs supported in 2020 cannot be compared with the 2010-2012 baseline of FMO's Doubling and Halving strategy as explained in our dedicated [news article](#).

## 4. About our inputs

### 4.1 Impact Cards

An important input into the JIM is the data that is being collected via **Impact Cards**. Within FMO, Impact Cards are in place to capture the impact related indicators for an investment and a client. Our Deal Teams fill-in the Impact Cards after contracting and update them annually at review according to the credit client review (CCR) calendar. There are several types of Impact Cards, including common indicators but also a specific set of indicators depending on the sector's, the investment type (corporate finance, project finance, PE Fund, FI), and government funds requirements. Generally, the values in the Impact Cards should be based on reliable source documents, for example audited annual reports. In other cases, FMO requests its clients to populate dedicated impact templates.

As per 2021, FMO will migrate to a new system that replaces Impact Card. This **Sustainability Information System** (SIS) will introduce more granular type of Impact Cards. Any changes will be reflected in a next version of this document.

FMO does not establish Impact Cards for all of its clients. Here we describe the main **exemptions** that FMO applies. In case FMO is not the **lead arranger** of a transaction an Impact Card is not mandatory. **Convertible grants** are typically used in the exploration phase of a project. In this phase, there is no reliable information about impact. Therefore, no Impact Card is required. Investments for clients that are **exempted from reviews** according to the credit client review calendar, are also exempted from the submission of an impact card at review. An exception are the investments for MASSIF, BP, AEF in which case the Impact Card still needs to be populated. Impact Cards for clients at which FMO has a total committed amount **lower than 500K** are exempted from making an Impact Card (both contracting and review).

Together with other data sources, the data that is available in Impact Cards is then used for running the JIM. As for the other impact indicators that we report in our Annual Report, we hereby use the following rules:

- *Mapping to year* – Impact data are recorded per year i.e. if the reporting date of the client is March 31, 2018, the data is reported for the year 2018, alike clients for which the reporting data is 31 December 2018.
- *Most recent data available* – Impact indicators are reported for the entire portfolio based on the actual results of the investments using the most recent data available. For the Annual Report 2019, this means that numbers reflect annual results of investments for 2019 to the extent that information is available, and otherwise 2018 (or 2017) numbers. When investments are no longer in the portfolio as of December 31, 2020, impact numbers are put to zero. This date is chosen to align impact reporting with financial reporting.
- *EUR reporting* – Many of our financing and investing activities take place in foreign currencies, mostly US dollars. Unless explicitly stated in specific cases, all new commitments, mobilized funds and green investments mentioned throughout the report have been translated into our functional currency, the Euro, based on the foreign exchange rates at the date of contracting. Figures referring to the year end committed portfolio have been translated into euros using the year end foreign exchange rates.

### 4.2 Data quality controls

The quality of this set of client indicators is important for the data quality of the model's output. Therefore, a robust process with well roles and responsibilities is in place. Every Impact Card is independently verified by the Finance Department. Over and above this four-eye principle, we perform **portfolio** data quality controls on the Impact Cards (input-check) and the results of the JIM (output-

check). These latter portfolio data quality controls are performed before we publish as part of the Semi- and Annual Report.

### 4.3 Rules and exceptions

The FMO application of the JIM is the same as the other users of the JIM. However, rules and exceptions take place in the gathering of the input data as not all information is (yet) readily available in our data and information systems. These are summarized below:

- *Capital Outstanding* – In order to attribute the indirect effects in the JIM, the outstanding amounts are needed as in an input. At FMO, we are using **net carrying value** instead of the outstanding amount. This value includes loan impairments and equity valuation unlike total commitment or book values.
- *Construction (direct) jobs* - As part of the EDFI harmonisation, it was decided to split between jobs at construction and operation, whereas FMO only collected at operation and management in the past. This additional job type relates to any type of project, e.g. project finance. As the Impact Card software was not adjusted, this additional type of job is currently not available.
- *Sector breakdown for financial institutions* - The new JIM uses the portfolio breakdown of the financial institutions to model the indirect jobs supported via financial institutions. In other words, the JIM uses the underlying exposure to estimate indirect jobs. If this information is unavailable, then there will be zero impact from the portfolio from a financial institution. The current assumption in running the JIM is that, for clients contracted after 2015 for which we have portfolio at contracting, we assume the portfolio breakdown at contracting remains constant.
- *Revenues for projects in operation* - In the JIM, we look at portfolio and therefore consider projects that are in operation. In order to estimate the indirect effects, we need the revenues being generated for these projects. Again, this new data field was not yet incorporated in the Impact Card. No estimations are included in the results.
- *Results at investee level (revenues, assets)* - We are collecting impact data at investee level as we run at portfolio level. Again, since the impact card upgrade is not yet completed, we are estimating assets and revenues from investees from the share of investments. For investees where the instrument is debt, we are unable to estimate assets and revenues meaning these investments are not considered in the results.
- *Switch from non-current assets to total assets* - We are collecting impact data at investee level as we run at portfolio level. We are estimating assets and revenues from investees from the share of investments. The attribution in the JIM uses total assets. For those clients identified as outliers (in terms of attribution) we individually inputted total assets in the non-current assets data field in impact card to remediate some of the unexplained results.
- *Debt funds* - FMO enters data for the entire portfolio of debt funds, instead of taking the underlying share of the fund in the underlying investees. These have now been adjusted in the inputs for the model. The new SIS will have a debt fund option so that this information is better included in the results.
- *Manual overrides* – Due to the complex nature of some of our clients that have multiple type of business, we perform manual overrides to ensure that the attribution works accurately (~ 13 clients) to better reflect the results. Another set of clients are excluded entirely from the results (~11 clients) because they are a holding or SPV of a set of clients that we already are including in the JIM.
- *Use of funds* – When FMO provides a to a financial institution that has a use of proceeds (e.g. Green or SME fund clause) the indirect effects are calculated for the entire bank, not solely for the use of proceeds.

## 5. Open Access

### 5.1 About the JIM initiative

Since 2015, FMO uses the Impact Model to measure the indirect effects of its investments for indirect jobs. The model was originally developed to quantify FMO's doubling and halving strategy. Over the years other development finance institutions (DFIs) started to use similar methodologies. In January 2019, Proparco, CDC and FMO informally agreed with Steward Redqueen to harmonize their methodologies on indirect jobs measurement. Steward Redqueen had assisted these EDFIs to quantify the indirect impact associated with their investments. Although the fundamental methodology used in these impact models was the same for all parties (input-output modeling), decisions on assumptions and the implementation of the model differed significantly, making results incomparable.

The initiative accelerated as part of the EDFI harmonization where a working group was established for indirect jobs. FMO and CDC, together with Proparco, BIO, AfDB, and FinDev took the lead to harmonize the methodologies for direct and indirect jobs under the EDFI harmonisation. For indirect jobs, this required the alignment of methodologies used, of underlying macro data used and of client data used for running the model. Almost a year later, the model will soon be made open access, which means that it will be accessible for all development banks and impact investors who wish to use the JIM.

The JIM is part of FMO's endeavours to work towards harmonized models, methodologies and indicators at a global level. Measuring and reporting on impact in a consistent and comparable way is essential to evaluate global development needs and priorities, assess effectiveness of investments, and drive impactful actions. Together with our partners in the JIM, we have now established a solid cooperation where we can add future modules like quality of jobs to support impact measurement globally – this infrastructure is much needed if we truly want to become transparent and be able to compare results with others.

### 5.2 Join us!

On 27 November 2019, members of the Governing Board organized a webinar to present the JIM to a broader audience and start engaging outside of the working group. 380 people signed up for the webinar, over 100 attended and 70 people had indicated they wanted to be updated with further development and would consider learning how to use and reporting with this model once it becomes open access. JIM was also presented at the World Bank meetings in October 2019 and during an MDB results measurement meeting on 13 December 2019 in Paris by AfDB. As per January 2021, the model has become open access to institutions that have indicated interest in using the JIM.

If you are also interested in using the model, further information is available on the [website](#).

# Annex: List of sensitivities

Below we provide an updated list of the sensitivities that we also included in our former Impact Model description.

Data sensitivity			
Applicability	Issue	Consequences for FMO impact	Mitigation
Revision of GDP	Increase or decrease of total GDP	An upward revision of a country's GDP is an indication of higher productivity. This could mean that by using the 'old' data, FMO's employment impact is overestimated (and vice versa).	Use of most recent GDP data available to calculate labour productivity, base year of latest GDP data is 2018.
	Increase or decrease in GDP/ output ratio	A current underestimation of GDP related to output would mean an overestimation of FMO's employment and GHG impact, and an underestimation of value-added effects (and vice versa).	Update the model once every couple of years when more recent GTAP data is available
Agriculture consumption	Agriculture consumption is minimal	Tracing own consumption of agriculture would mean an overestimation of all FMO's impacts on agriculture and an overestimation of induced effects.	Adapt input-output tables in a way that private consumption of agricultural products and agricultural sourcing from agriculture is zero.
Allocation of countries to regional input-output tables	Country is poorer or richer than average of regional table	As productivity in poorer countries is lower and energy use is less efficient, FMO's employment and GHG impact is underestimated, and value-added impact overestimated (and vice versa).	Careful selection of regions based on country income classification.
	Country's electricity generation is cleaner or dirtier than the average of regional table	This means that FMO's GHG impact is overestimated (and vice versa).	As this applies in two directions, the over and underestimations of impact of investments in various regions levels out.
	Country is allocated to region where capital productivity is higher or lower	This would mean an overestimation of directly related economic output to FMO and thus an overestimation of all impacts related to FMO (and vice versa).	Countries are allocated to regions based on their income classification which is often more or less in line with their capital productivity.
	Country is allocated to region where labour productivity is higher or lower	This would mean an underestimation of FMO's employment impact (and vice versa).	Countries are allocated to regions based on their income classification which is often more or less in line with their labour productivity.
Capital data	Incomplete capital data	Incomplete capital data can implicate an over or underestimation of capital. This would mean an over or underestimation of directly related economic output when output/ capital ratios are used. Hence, impact results would be over or under estimated.	We use the best available data, supplementing GTAP information by private sector gross fixed capital formation of the World Bank Development Indicators.
Revenues	FX-rate on effective date	Used to calculate capital to output ratio (revenues/non-current assets). FX rate should be consistent with (non-current) assets.	We apply consistent FX rates for revenues and assets.
Employment data	Limited availability	Insufficient data could lead to an over or underestimation estimation of FMO's employment impact.	We use the best available national data. We apply the employment intensities of countries of which more detailed data is available to the aggregate regions for which insufficient data is available. Employment proxies have been selected based on data availability and proximity of country GDP per capita to regional GDP per capita.



Data per end-beneficiary type	Limited data available on labour productivity per end-beneficiary	Applying the general employment intensities (average of formal and informal sector) to FMO's end-beneficiaries, could lead to an over or underestimation of FMO's employment effects.	We calculated formal employment intensities and applied these to all FMO's direct end-beneficiaries to avoid an overestimation of FMO's impact. To do this we used best available national data on productivity of the formal sector versus the informal sector from the International Labour Organization (ILO). We assume Small and Medium Enterprises (SMEs) are responsible for about 45% of formal employment, while contributing about 33% to formal GDP <sup>1</sup> . We apply this to all regions and sectors. That means SMEs require 1.36 times (45/33) the people to produce the output, and corporates need 0.82 times (55/67) the people to produce the output.
Sector electricity intensity	Expenses on electricity per sector are used as indicator for the amount of kWhs consumed per sector	Electricity use of sectors that have gained a discount on electricity costs is underestimated. This could change the power enabling impact per sector of FMO.	Accept

#### Data sensitivity - Converting FMO investments into directly related economic output

Applicability	Issue	Consequences for FMO impact	Mitigation
Equity/ debt	Investments in equity facilitate attraction of additional capital	Not distinguishing equity and debt might underestimate FMO's impact as impact linked to the attraction of additional capital is not considered.	Accept until better literature is available on the average leverage effect per sector and country.
1-1 relationship project finance - output	Not all project finance might be spent in the local economy in one year.	This might lead to an overestimation of FMO's impact.	Accept. In the 2020 look to annualize expenditures of a project.
Capital productivity per end-beneficiary type	No data available on capital productivity per end-beneficiary type	The capital-to-output ratio of 1:0.35 applies across all firm sizes. However, smaller firms (i.e. micro enterprises and SMEs) are expected to be more capital-scarce than bigger firms (i.e. large enterprises). Relieving this capital constraint by providing access to capital is therefore expected to have a bigger effect on smaller firms than on large enterprises.	The JIM adjusts the capital-to-output ratio for firm size, based on ratios from a study from Bas et al (2010) <sup>2</sup> . The numbers show that micro enterprises and SMEs produce 1.2 times more output with one unit of capital than the economy average, and corporates only 0.73

#### Data sensitivity - Calculating related money flows of directly related economic output

Applicability	Issue	Consequences for FMO impact	Mitigation
Imports excluded for both jobs and GHG emissions	-	By not tracing money flows to imports any further, FMO's impact on a global level is underestimated.	The impact related to FMO should be communicated as local impact.

<sup>1</sup> International Finance Corporation. (2010). Scaling-Up SME Access to Financial services in the Developing World. <http://documents.worldbank.org/curated/en/669161468140035907/pdf/948300WPOBox385443B00PUBLIC00ScalingUp.pdf>

<sup>2</sup> These adjustments are based on leverage estimates that include short- and long-term debt as well as equity share of capital. See Bas, T. Muradoglu, G & Phylaktis, K. (2010). *Determinants of Capital Structure in Developing Countries*. [https://www.researchgate.net/publication/228465937\\_Determinants\\_of\\_Capital\\_Structure\\_in\\_Developing\\_Countries](https://www.researchgate.net/publication/228465937_Determinants_of_Capital_Structure_in_Developing_Countries)

### Data sensitivity - Calculating directly enabled economic output by FMO energy investments

Applicability	Issue	Consequences for FMO impact	Mitigation
Power production related to FMO	Not all power produced might be domestically consumed	By tracing all power production related to FMO, FMO's forward linkage impact might be overestimated, as some power might be lost or exported.	Accept
Causality electricity consumption-GDP growth	Limited data availability	The relationship between energy and GDP has been a topic of research, with mixed results: many studies confirm a cointegration of economic growth and energy or electricity consumption, but the direction and causality differ. Despite this, it is generally accepted that adequate supply of reliable energy is essential for economic growth and past values of electricity consumption do have a predictive ability for economic growth. The relation between electricity consumption and GDP growth is crucial for calculations of FMO's power enabling impact related to energy. Over and underestimations are possible.	To account for enabling effects of electricity investments, the JIM combines two main factors to model the effects of power: the share of energy in a country contributed by the generation of the company/project invested in, and a fixed power-to-output translation factor of 0.02 for all countries and sectors. This is a straight average of the sector multipliers of four out of the 11 case studies (i.e. Uganda, Nigeria, Uruguay and Turkey). This selection of four case studies excludes outliers, and countries for which only high-level data was available. The power-to-output translation factor of 0.02 is in line with the ratios used in other models (e.g. IFC). Combining the power-to-output translation factor with the share of power contributed in a country determines the percentage output increase supported. This is combined with SAM output data to estimate the total output enabled. Total output enabled is subsequently used to estimate value added, employment and GHG emissions impacts.

### Data sensitivity – Data collection/mapping

Applicability	Issue	Consequences for FMO impact	Mitigation
Attribution of client data to FMO	Attribution	Attributing all impact related to an FMO client to FMO would mean an overestimation of FMO's impact.	We divide FMO's net carrying value related to a client by the total asset value of the client to calculate the share of output that can be attributed to FMO.
Project finance mapped to the construction sector	Backward Temporary	Infrastructure projects generate most effects by enabling economic activities. However, during the construction phase, backward linkage economic activities are also supported. Allocating infrastructure project finance to e.g. energy would not be representative for the backward linkages.	We allocate project finance to the construction sector to calculate the backward linkages. Please note that this is a temporary impact.
FMO NACE sector allocation	Not specific enough for FMO clients	In case an FMO investment doesn't adequately fit its corresponding NACE sector in the model, this can to incorrect calculations of FMO's impact.	Add granularity where possible for example SME sector allocation, and energy technology type.

### Data sensitivity - Calculating employment related to FMO investments

Applicability	Issue	Consequences for FMO impact	Mitigation
Non-energy project finance	No/ limited data available on causality between non-energy infrastructure and GDP growth	Not taking into account forward linkage impact of non-energy project finance would lead to an underestimation of FMO's impact.	Accept. Work in 2020 on improving infrastructure effects of our investments.