



INSTITUTO TECNOLÓGICO DE AERONÁUTICA  
CURSO DE ENGENHARIA CIVIL-AERONÁUTICA

## **RELATÓRIO DE ESTÁGIO**



Paris, 15/10/2018

Nome do Aluno: Rajan Ribeiro Tupinambá

# **Folha de Aprovação**

Relatório Final de Estágio Curricular aceito em (data) pelos abaixo assinados:

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# **Informações Gerais**

## **Estagiário**

Nome do Aluno: Ribeiro Tupinambá, Rajan

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## **Orientador/Supervisor da Empresa**

Tim Treharne e Matthieu Muzumdar

## **Orientador/Supervisor do ITA**

Francisco Alex Correia Monteiro

## **Período**

05/03/2018 – 06/07/2018

Total de horas: 704

## **Acknowledgments**

I would like to thank the whole Meridiam team at Paris' office for their warm welcoming and guidance during the 10 months of my internship.

I extent thanks to M. Matthieu MUZUMDAR, M. Tim TREHARNE and M. Julien TOUATI for the support and mentoring. In special, I'd like to thank Christelle, Hugo, Toriki, William and Amir for the initial classes and for the companionship during the projects developed.

Finally, many thanks to Umut, Erwann, Stéphanie, Jonas, Ginette, Mete and Valentin for, along with the aforementioned, making the office such a light and pleasant place to work. It's also due to the positive spirit at Meridiam that I can assert that this was an incredible experience.

## Résumé

Le développement de schémas plus solides de partenariats public-privés et de concessions depuis la fin des années 90, en Europe et en Australie notamment, a permis la création du métier de financement de projets, un appareil plus spécialisé et efficace pour développer les énormes projets dans ce domaine. C'est dans le cadre du financement de projets que l'infrastructure publique s'est considérablement évolué en taille, efficacité et qualité de service.

C'est d'où mon intérêt pour le métier et pour faire mon stage au sein de Meridiam, un leader européen et acteur mondiale dans ce domaine. Meridiam investisse dans des projets d'infrastructure sociale, dans des projets de transport et dans des projets encadrés dans la transition énergétique, tous secteurs que beaucoup m'intéressent et que je tiens comme d'énorme importance.

Ce rapport expose les expériences que j'ai eu et les connaissances acquises au long des 10 mois passées chez Meridiam, comprenant surtout la modélisation financière, le suivi des réunions, les présentations internes et la négociation des contrats.

Mots-clés : *Partenariat Public Privé, Investissement, Fonds, Contrat d'achat d'énergie, Financement, Modélisation financière.*

# Synthèse du rapport en français

## Meridiam

Meridiam est un développeur mondial privé, investisseur et gestionnaire d'actifs spécialisé dans les infrastructures publiques et communautaires gérées dans le cadre de partenariats public-privé (PPP) avec 6,2 milliards d'euros d'actifs sous gestion. Il s'agit d'une organisation à gestion indépendante, déterminée à aligner son éthique à long terme sur les buts et objectifs des parties prenantes du secteur public.

Meridiam a été créé en Europe par Thierry Déau, ancien directeur général d'Egis Projects (filiale de la Caisse des Dépôts et Consignations, spécialisée dans le développement, le financement et la gestion de projets d'infrastructure) en 2005, avec le soutien opérationnel et financier d'AECOM Technology Corp. le groupe Crédit Agricole.

La société a maintenant des bureaux dans 8 endroits différents du monde (Paris, New York, Istanbul, Toronto, Dakar, Luxembourg, Addis-Abeba et Vienne).

En investissant dans ses fonds sur 25 ans, Meridiam développe, finance, construit et gère divers types de projets :

- Infrastructures de transport (lignes ferroviaires à grande vitesse, autoroutes, tunnels, ports, tramways, etc.)
- Infrastructure sociale (écoles, universités, centres de santé, stades, etc.)
- Bâtiments publics (palais de justice, bureaux du gouvernement, ministères, etc.)
- Réseaux et services de distribution (eau, gestion des déchets, énergie, etc.)

Meridiam est également signataire des Principes pour l'Investissement Responsable (PRI) des Nations Unies depuis 2010 et a adopté depuis sa création une Charte de déontologie axée sur les questions environnementales, sociales et de gouvernance (politique ESG).

La société attribue les conditions de conformité à la politique ESG dans le cadre de chaque contrat signé avec ses partenaires et réalise les due diligences KYC afin de s'assurer que sa charte éthique est respectée dans tous les projets sous la direction de Meridiam.

## **Le Fonds Transition**

Meridiam Transition a été lancé en novembre 2015 en partenariat avec CNP Assurances, dans le cadre de la COP21 (Sommet sur les changements climatiques de Paris). Le fonds offre une réponse innovante aux défis de la transition énergétique en contribuant au financement à long terme de projets d'investissement vierges. Meridiam Transition cible principalement des projets de développement dans les domaines de l'efficacité énergétique, de l'approvisionnement local en énergie, des réseaux intelligents et des énergies renouvelables innovantes.

Le fonds investit principalement en France et dans d'autres États membres de l'UE. Son objectif est d'investir dans une vingtaine de projets de petite et moyenne taille.

## **Maître de Stage – M. Tim Treharne**

Tim Treharne exerce les fonctions de chef de l'exploitation, Europe.

Tim Treharne a rejoint Meridiam en 2011 en tant que directeur général des opérations en Europe après une carrière de 30 ans dans les secteurs bancaire et financier, puis vice-président de KPMG Global Infrastructure, où il a dirigé le développement des équipes Infrastructure au Royaume-Uni, aux États-Unis, en France et en Amérique latine. .

Tim a été étroitement impliqué dans le développement du concept de PFI au Royaume-Uni à la suite du programme de privatisation des années Thatcher. Depuis, il collabore avec des gouvernements et des entités du secteur privé du monde entier pour développer ces concepts dans le cadre de diverses transactions importantes.

Après 13 années passées au sein de NatWest / NatWest Markets, où il a dirigé plusieurs financements de projets dans les domaines de l'énergie, de la transformation et des télécoms, ainsi que pour la création de l'équipe de conseil en financement de projets de NatWest, Tim a rejoint la Bank of America / Bank of America Securities pour développer le marché européen de financement de projets et a été nommé responsable mondial de l'infrastructure. Ce rôle incluait la responsabilité des activités de conseil et de prêt dans les infrastructures à travers le monde et la composition du comité de crédit pour toutes les opérations de prêt d'infrastructures.

## **Maître de Stage – M. Matthieu Muzumdar**

Matthieu Muzumdar est Directeur Général Adjoint Europe et Relations Investisseurs.

Matthieu a rejoint Meridiam en 2011 en tant que Directeur des investissements, en charge du développement de projets en Europe. Il a notamment développé des projets en France, en Belgique et en Turquie. En 2013, il a assumé la responsabilité de la fonction Relations avec les investisseurs, en charge de la gestion des relations avec les investisseurs existants et potentiels à l'échelle mondiale, en dirigeant la collecte de fonds des quatre derniers fonds Meridiam ainsi que les activités de co-investissement.

Avant de rejoindre Meridiam, Matthieu a travaillé pour le ministère des Transports français en tant que chef de l'unité d'exploitation des concessions. À ce titre, il était responsable de la gestion de tous les contrats de concession routière français couvrant un réseau de plus de 8 000 km, supervisant les programmes d'investissement, les prix, les aspects contractuels et dirigeant une équipe d'avocats et d'ingénieurs. Avant cela, Matthieu était responsable de projet pour le développement de projets routiers dans un cadre de concession.

Matthieu est diplômé de l'Ecole Polytechnique et de l'Ecole Nationale des Ponts et Chaussées à Paris. Il a enseigné le financement de projets à l'Ecole Nationale des Ponts et Chaussées de 2009 à 2015 et est, depuis 2016, directeur du programme de maîtrise «*Infrastructure Project Finance*».

### **Le travail et activités connexes**

L'objectif principal de mon poste de stagiaire en analyste en placements était d'être formé pour pouvoir évaluer, développer et soumettre de nouveaux projets en effectuant les tâches subalternes d'un analyste, à savoir :

- Analyse des investissements et modélisation financière des projets, y compris des études de TRI et de sensibilité du marché ;
- Négociation et analyse contractuelles avec des partenaires, des fournisseurs, des entrepreneurs et des acheteurs ;



- Préparation et soumission des offres financières aux appels d'offres et aux appels à projets ;
- Préparation de présentations et de rapports aux investisseurs et au conseil d'administration et à l'équipe de conformité de Meridiam ;
- Participation et conduite de réunions et d'appels avec des partenaires et des clients ;
- Mise à jour de la base de données des projets de Meridiam.

Plus précisément, j'ai travaillé sur différentes étapes sur 24 projets, dont 4 ont été clôturés en 2017 et 14 sont en cours d'exécution en 2018. En raison de l'étendue des projets sur lesquels j'ai travaillé, j'ai choisi 3 projets à décrire en détail dans ce rapport : transaction Evergaz, micro-centrales de stockage à pompage en Martinique et centrale géothermique dans le Massif Central. Dans la description des projets, je me concentrerai sur les tâches pour lesquelles je me suis le plus dévoué. Les tâches choisies sont celles qui m'ont fait grandir et apprendre le plus au cours de mon stage.

Au niveau inter-relationnel, j'ai amélioré ma capacité à communiquer avec des personnes de différents horizons dans un environnement multiculturel, à la fois en anglais et notamment en français, dans la plupart des situations très différentes auxquelles l'analyste est tenu (avec ses collègues, partenaires, conseillers et pouvoir concédant).

Au début de mon stage, j'ai surtout formé mes compétences à l'élaboration de mes premiers modèles financiers et de rapports internes ad-hoc. Il m'a fallu environ 3 à 4 semaines pour intégrer une équipe de projet. Au fil du temps, mes collègues m'ont confié des tâches plus complexes et plus intéressantes au fur et à mesure que je progressais dans les compétences, l'environnement était toujours difficile et stimulant.

Durant mon stage, j'ai fait face à de nombreuses situations difficiles, à des délais et à des défis apparemment insurmontables, mais échanger avec des personnes plus expérimentées et demander de l'aide m'a permis de m'attaquer à tous ceux qui ont la tête haute. J'ai confirmé ma motivation à participer à des projets d'ingénierie à grande échelle grâce au financement de projets, encore et encore, après chaque obstacle.

# Table of contents

SUMMARY SHEET .....	ERROR! BOOKMARK NOT DEFINED.
ACKNOWLEDGMENTS .....	3
RÉSUMÉ .....	5
SYNTHÈSE DU RAPPORT EN FRANÇAIS .....	6
TABLE OF CONTENTS .....	10
LIST OF TABLES .....	11
LIST OF FIGURES .....	12
1. INTRODUCTION.....	13
2. PRESENTING THE COMPANY AND THE <i>MAÎTRE DE STAGE</i> .....	14
2.1. MERIDIAM.....	14
2.2. TRANSITION FUND .....	16
2.3. MAITRES DE STAGE – M TIM TREHARNE .....	18
2.4. MAITRES DE STAGE – M MATTHIEU MUZUMDAR .....	18
3. THE WORK AND RELATED ACTIVITIES.....	20
4. INVESTMENT PROCESS .....	21
5. EVERGAZ TRANSACTION .....	23
5.1. INTRODUCTION TO THE TRANSACTION .....	23
5.2. ROLE IN THE PROJECT .....	24
6. MICRO PUMPED STORAGE POWER STATIONS IN THE MARTINIQUE .....	29
6.1. INTRODUCTION TO THE PROJECT.....	29
<i>Project background</i> .....	29
<i>Technology</i> .....	30
6.2. ROLE IN THE PROJECT .....	30
<i>Financial modelling</i> .....	30
7. CONCLUSION AND PERSONAL REVIEW.....	34
BIBLIOGRAPHY .....	36

## **List of tables**

Table 1: Meridiam Funds .....	14
Table 2: ESG themes and main criteria.....	16
Table 3 - Example of one of the sets of sensibilities developed for one of the power plants ..	26
Table 4 - Sensitivity Table (including internal rate of return and minimum debt service coverage ratio) .....	32

## List of figures

Figure 1: Meridiam offices.....	15
Figure 2: Assets distribution under the Transition Fund.....	17
Figure 3: Assets and Pipeline projects classifications and locations .....	17
Figure 4: Summary of the investment process .....	21
Figure 5 - Screenshot of the input sheet of one of the financial models .....	25
Figure 6 - Post tax junior funds IRR and the cashflows of one of the acquired plants.....	27
Figure 7 - Evergaz's assets and subsidiaries.....	27
Figure 8 - Contractual Structure for Saint-Pierre's Project .....	29
Figure 9 - Forecasted Meridiam Post-Tax Junior Funds IRR under a Full Equity Scenario ...	31
Figure 10 - Forecasted Meridiam Post-Tax Junior Funds IRR under a [50:50] Gearing Scenario .....	31

# 1. Introduction

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Project finance is the biggest flagship of the latest public infrastructure development, made through public-private partnerships and concessions. Its pioneering structure enables projects to be developed with a healthy efficiency-profitability balance, whereas the projects made under the public machinery were always lacking one or both of those characteristics.

It's because of its remarkable achievements in the transport and social infrastructure sectors, as well as on the renewable energies more recently, and because of its complex and fascinating structure that I've aimed to have my internship in the area, within Meridiam, a leader in the European project finance and a notorious actor worldwide.

In the report I'll describe some of the most interesting experiences I've had while working at Meridiam, starting with a description of Meridiam, its funds, investment process and policies and a presentation of my internship tutors.

This introduction to the company is followed by a description of two projects I've worked with during my internship, accompanied by the tasks I was assigned to, putting my internship in perspective with the whole investment process and team. The report then includes the evolution of my work and abilities, along with a personal review and a conclusion that highlights what the experience has added to my career path and professional life.

## 2. Presenting the company and the *maîtres de stage*

### 2.1. Meridiam

I've done my internship within Meridiam, a private global developer, investor and asset manager specializing in public and community infrastructure delivered through public-private-partnerships (PPPs) with €6.2bn assets under management. It is an independent managed organization, committed to aligning its long-term ethos with public sector stakeholder goals and objectives.

Meridiam was established in Europe by Thierry Déau, formerly Chief Executive of Egis Projects (a subsidiary of France's Caisse des Dépôts et Consignations, specialized in developing, financing and managing infrastructure projects) in 2005, with operational and financial support from AECOM Technology Corp. and the Crédit Agricole Group.

The company has now offices in 8 different locations around the globe (Paris, New York, Istanbul, Toronto, Dakar, Luxembourg, Addis Ababa and Vienna) and its structure comprises 7 different funds:

Table 1: Meridiam Funds

	Meridiam Infrastructure SICAR <sup>2</sup>	Meridiam Infrastructure Europe II <sup>5</sup>	Meridiam Infrastructure Africa Fund	Meridiam Infrastructure Europe III	Meridiam Transition	Meridiam Infrastructure North America II	Meridiam Infrastructure North America III
Asset class	Infra	Infra	Infra	Infra	Infra	Infra	Infra
Year of creation	2008	2012	2015	2016	2016	2012	2017
Duration of the fund	25	25	15	25	20	25	25
Geographical area	OECD countries in Europe and North America	Europe, including Central and Eastern Europe	Africa	Europe, including Central and Eastern Europe	Europe	OECD countries in North America and South America	OECD countries in North America and South America
Types of projects	Transport infrastructures Social infrastructures	Transport infrastructures Social infrastructures Energy infrastructures	Public utility services and networks Energy infrastructures Transport infrastructures Social infrastructures	Transport infrastructures Social infrastructures Public buildings Energy infrastructures	Public utility services and networks Energy infrastructures	Transport infrastructures Social infrastructures Public buildings	Transport infrastructures Social infrastructures Public buildings



Figure 1: Meridiam offices

Investing through its 25-year funds, Meridiam develops, finances, builds and manages various types of projects:

- Transport infrastructure (high-speed rail lines, highways, tunnels, ports, tramways, etc.)
- Social infrastructure (schools, universities, healthcare centers, stadiums, etc.)
- Public buildings (courthouses, government offices, ministries, etc.)
- Utility networks and services (water, waste management, energy, etc.)

Meridiam is also a signatory of the United Nations' Principles for Responsible Investment (PRI) since 2010 and adopted since its inception an Ethics Charter focusing on environmental, social and governance issues (ESG policy).

The company allocates ESG policy compliance terms under every signed contract with its partners and realizes KYC due diligences in order to assure that its Ethics Charter is being respected in all projects under Meridiam's management.

Table 2: ESG themes and main criteria

ESG THEMES	Examples of criteria for the evaluation of investments
WORKING STANDARDS	Free from child labour Free from forced or compulsory labour practices Good working conditions, in terms of health / safety and equality
LAWS AND REGULATIONS	Legal context and compliance Procurement procedure
ESG CAPACITY	Client's ESG policy and procedures ESG policy and procedures of Meridiam's Partners
ENVIRONMENTAL ISSUES	Impacts on the physical components of the environment Impacts on nature protection areas and biodiversity Impacts on fauna, flora and habitats Environmental measures
SOCIAL ISSUES	Social impacts Cultural heritage Interests of stakeholders Land acquisition and resettlement
ENERGY, CARBON AND CLIMATE	Vulnerability to climate change Contribution to the fight against climate change Combined risk relating to the Energy and Carbon market and Climate risk

In January 2012, Meridiam was the first investor and asset manager to receive ISO 9001 certification for its activity including its sustainable investment process, the certification was renewed in 2017 and is now based in the last version of the norm (9001:2015).

## 2.2. Transition Fund

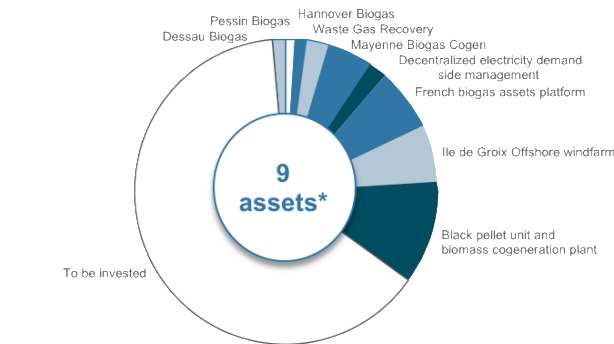
The internship took place in Meridiam's Paris office, taking part in 24 projects under Europe III and Transition funds, being the latter the one in which I've worked the most.

Meridiam Transition was launched in November 2015 in partnership with CNP Assurances, in the context of COP21 (Paris Climate Change Summit). The fund offers an innovative response to the challenges of energy transition by contributing to the long-term financing of greenfield investment projects. Meridiam Transition mainly targets development projects in the field of energy efficiency, local energy supply, smart grids and innovative renewable energies.

The fund invests primarily in France and in other EU states. Its aim is to invest in around 20 small and medium sized projects.



## Asset Diversification



Fund Size	485m€
Assets in Portfolio	171m€

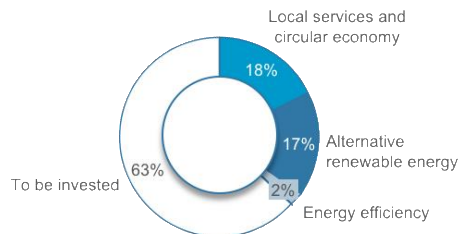
## 9 projects closed or secured in 2017\*

Dessau, Pessin and Hannover Biogas Assets	Biogas methanization plants in operation since 2014, located in Germany
Decentralized electricity demand side management (with Voltalis)	Operation of 100 MWp demand-side capacity and development of a 10GWp new capacity in France
Mayenne Biogas Cogeneration	Biogas cogeneration plant, in France
Waste Gas Recovery (with WAGABOX)	WAGABOX units transforming landfill biogas into biomethane, in France
French biogas assets platform (with Evergaz)	Platform of 3 brownfield and 3 greenfield projects
Ile de Groix Offshore windfarm*	24MW floating wind farm, in France
Black Pellet Unit and Biomass Cogeneration plant*	Black pellet unit and biomass cogeneration plant

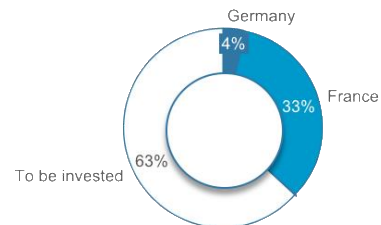
\*Including 2 secured projects for which financial close is in progress

Figure 2: Assets distribution under the Transition Fund

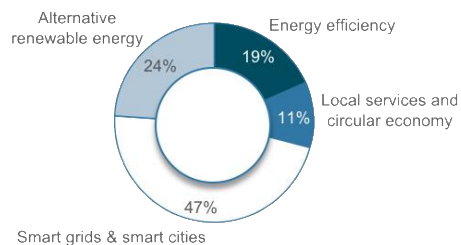
## Portfolio of assets by sector



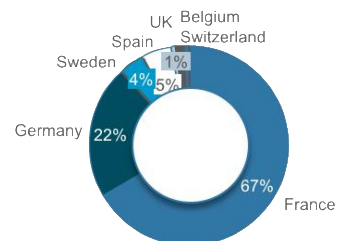
## Portfolio of assets by geography



## Transition Pipeline by sector



## Transition Pipeline by geography



Note: All figures as of Q4 2017

Figure 3: Assets and Pipeline projects classifications and locations

### **2.3. Maîtres de Stage – M Tim Treharne**

Tim Treharne acts as Chief Operating Officer, Europe.

Tim Treharne joined Meridiam in 2011 as Chief Operating Officer in Europe following a 30-year career in banking and finance, latterly as Vice Chairman of KPMG Global Infrastructure where he led the development of Infrastructure teams in the UK, the US, France and Latin America.

Tim was closely involved in the development of the PFI concept in the UK following the privatisation programme of the Thatcher years and has since worked with governments and private sector entities around the world developing these concepts on a variety of significant transactions.

After 13 years with NatWest / NatWest Markets where he led a number of project financings in the power, processing and telecoms areas as well as establishing NatWest's project finance advisory team, Tim joined Bank of America / Banc of America Securities to develop the European project finance business and was named Global Head of Infrastructure. This role included responsibility for advisory and lending activities in Infrastructure around the world and membership of the credit committee for all Infrastructure lending operations.

### **2.4. Maîtres de Stage – M Matthieu Muzumdar**

Matthieu Muzumdar acts as Deputy Chief Operating Officer, Europe and Investor relation Director.

Matthieu joined Meridiam in 2011 as Investment Director with a focus on project development in Europe, and has in particular developed projects in France, Belgium and Turkey. In 2013, he took responsibility for the Investor Relations function, in charge of managing relationships with existing and potential investors globally, leading the fundraising of the past four Meridiam funds as well as co-investment activities.

Prior to joining Meridiam, Matthieu worked for the French Ministry of Transport as head of the concession operations unit. In this role he was responsible for the management of all French highway concession contracts covering a network of over 8,000 km, overseeing

investment programs, pricing, contractual aspects, and leading a team of lawyers and engineers. Before that, Matthieu was project manager in charge of the development of highway projects under a concession framework.

Matthieu graduated from the Ecole Polytechnique and Ecole Nationale des Ponts et Chaussées in Paris. He has been teaching project finance at the Ecole Nationale des Ponts et Chaussées from 2009 to 2015 and since 2016, is the program director for the « Infrastructure Project Finance » masters program.

### 3. The work and related activities

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The main objective of my position as investment analyst intern was to be trained to be able to evaluate, develop and submit new projects by performing the junior tasks of an analyst, comprising:

- Investment analysis and project financial modelling, including IRR<sup>1</sup> and market sensitivity studies;
- Contractual negotiation and analysis with partners, suppliers, contractors and off-takers;
- Preparation and submission of financial proposal bids to public tenders and calls for projects;
- Preparation of presentations and reports to the investors and to Meridiam's board and compliance team;
- Participation and conduction of meetings and calls with partners and clients;
- Update of Meridiam's projects database.

More precisely, I've worked on different stages on 24 projects of which 4 were financially closed in 2017 and 14 are ongoing in 2018. Due to the extent list of projects I've worked on, I've chosen 2 projects to be described in detail in this report: Evergaz Transaction and Micro Pumped Storage Power Stations in The Martinique. In the description of the projects I'll focus on the tasks I dedicated myself the most to. The tasks chosen are the ones that made me grow and learn the most during my internship.

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<sup>1</sup> **Internal Rate of Return:** a metric that estimates the profitability of potential investments by attributing an annual rate of capital return.

## 4. Investment Process

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Lengthy and complex origination and bidding processes require specialized, disciplined project origination, risk assessment, development and management skills. The purpose of the Investment Process is to facilitate this activity based on the timely output of data that enables the visualization of complex information in a meaningful format thus promoting effective decision making, feedback and governance of the organization.

Based on clear objectives, the processes are designed to be coherent, consistent, and capable of repetition in respect of selecting projects and managing and evaluating project opportunities.

Each project at Meridiam is assigned to a project team or to an investment team member, which will be responsible for its development throughout the entire investment process, summarized as follows:

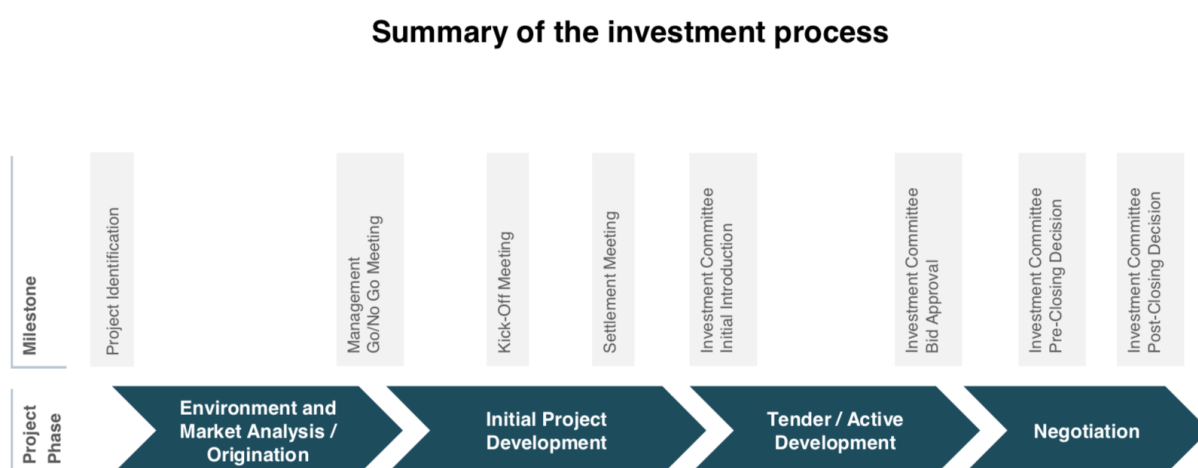


Figure 4: Summary of the investment process

### Project identification

Made by the senior employees, the business development team or by engineering companies that “knock on the door” to propose their projects.

### Management Go/No Go Meeting

It’s the first analysis of the project overall scenario, being characterized by the draft of a first paper with the findings of the investment team and their primary risk analysis and by the management’s decision on developing the project or not.

**Kick-Off Meeting**

Consists of a presentation with updates and a more detailed analysis of the project. It's the step in which a development budget (for the contracting of the advisory firms and for the initial expenses on licenses and studies) is considered and proposed, being approved or not during the meeting.

**Settlement Meeting**

It's the last internal stage, is a much more solid presentation, with more precise information and with a complete presentation of the outputs of the studies and of the project's IRR and, possibly, sensibilities and additional scenarios.

**Investment Committee Papers**

The last step before the investment itself is to prepare the complete analysis made by the project team and submit it to the board. These papers (differentiated by the phase in a bidding process, being updated between each of those) are also submitted to the investors. At the presentation of the IC Paper, the investment budget is approved or not.

## 5. Evergaz Transaction

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### 5.1. Introduction to the transaction

Today, in light of growing environmental awareness in terms of agricultural, industrial and public practices, methanization is becoming particularly attractive thanks to its proven technology and its twofold advantage: providing a treatment solution for waste and producing biomethane. In addition, European countries have implemented policies promoting the development of methanization project. For instance, in France, the “*Loi de la transition énergétique pour la croissance verte*” targets a 10% share of gas sources by 2030 for biomethane.

Meridiam, aligning those European targets with its Transition fund, established a strategic partnership with Evergaz, one of the leaders of the biogas sector in France and one of the few institutional players of this space. in the methanization<sup>2</sup> sector with the acquisition of Dessau & Pessin biogas assets in February 2017 and the acquisition of the Mehrum plant in September 2017. The partnership settled a compromise of investment of €30m in Evergaz’s pipeline of biogas projects.

In that context, Meridiam has been initially approached by Evergaz to take a majority participation in its French biogas assets platform, **BMP Holding SASU**, comprising six greenfield / brownfield methanization units in France.

During the deal negotiations, the transaction involved into 4 different operations:

- The acquisition of a majority share in Evergaz French biogas assets platform, BMP, comprising direct participations in six methanization units in France (three brownfield units and three greenfield units).
- The financing of (i) extensions of brownfield projects and (ii) the construction of greenfield projects. All these plants benefit from a robust and attractive remuneration framework: electricity is sold through a 20-year power purchase agreement and

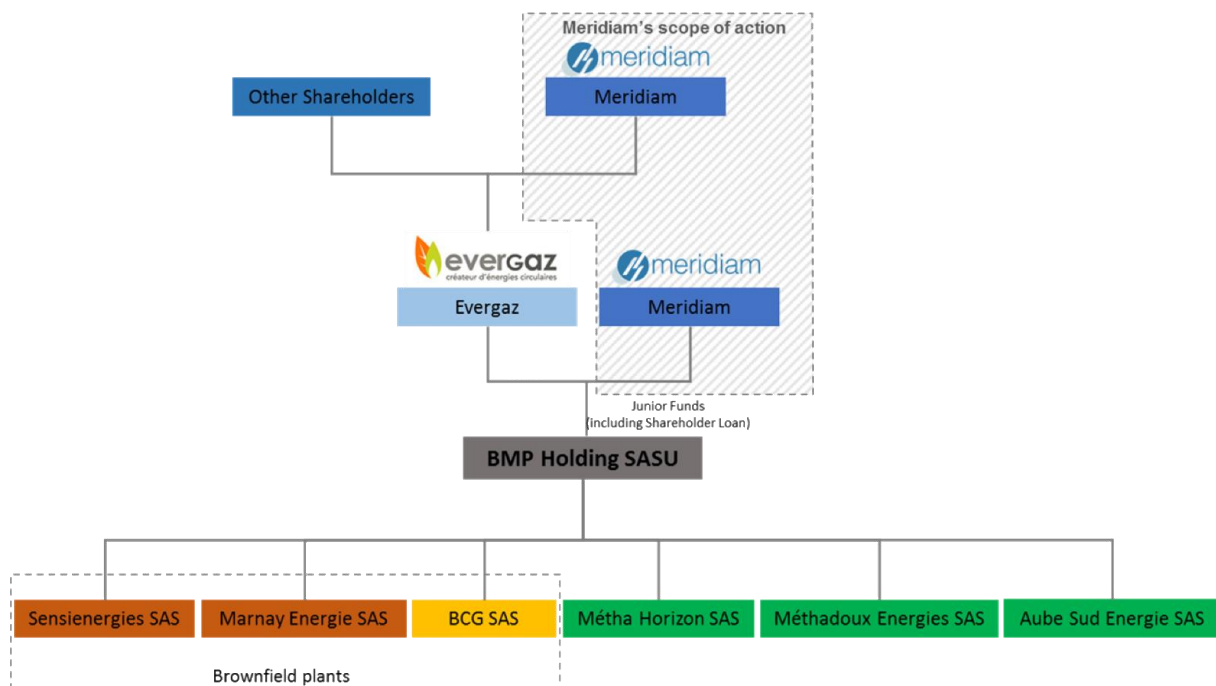
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<sup>2</sup> Methanization is a biological process in which organic matter (organic waste) is broken down by bacteria with a total absence of air or of oxygen. The process products biogas, a renewable fuel.

biomethane is sold through a 15-year standardized government-backed purchase agreement with attractive feed-in tariffs.

- The financing of the construction of pipeline projects verifying the following criteria:  
(i) post-tax junior funds IRR above 10%, (ii) a cogeneration or biogas injection plant, (iii) limited local competition to access feedstock and (iv) controlling stake for BMP.
- The acquisition of shares in Evergaz SA under the form of (i) a repurchase of minority shareholders and (ii) an increase in the share capital.

For the overall transaction, Meridiam ticket amounted to €30m. The transaction took place in April 10<sup>th</sup>, 2018.



## 5.2. Role in the project

In the Evergaz transaction I was assigned the following roles:

### Financial modelling



One of the most primordial tools to make investment analysis in project finance is to model all the project financial parameters, calculating the balance sheet, the P&L (profit and loss), and the SPV's shareholder cashflows.

Before being assigned to the Evergaz transaction, I was trained in financial modelling by a senior associate and assisted by an analyst. After this introduction, Meridiam offered me to follow the “F1F9 FAST modelling” online course, which capacitated me to be more precise in that activity.

When I was assigned the Evergaz transaction (I was assigned later than part of the team due to the change in the deadlines that were to be met), Meridiam had already designated an external financial advisor to make the full model for the 6 biogas powerplants. My role was, then, to run due diligences and troubleshoot the models, to propose new aspects and analysis to the advisers and to develop and run scenarios and sensibilities for each of the plants.

Modèle Financier  
HYP SCÉNARIO

Tous les contrôles sont bons

Solve

Dette

OK

TRI

Gearing Au Refinancement

15.12%

0.71

0.39

Erase sens.

Cas de base - P+I

Cas PPA - P+I

Cas d'Indexe

SCENARIO NUMERO : 1

SCENARIOS : 1 2

TRI

Date de début d'indexation - CAPEX

1-Jan-14

1-Jan-14

1-Jan-18

1-Jan-18

3. Hypothèses financières

3.1 Structuration

Gearing

73.00%

73.00%

73.00%

Subgearing

100.00%

100.00%

100.00%

TRI cible

11.00%

11.00%

11.00%

Tirage pari-passu (oui : 1 ; non : 2)

2

2

2

Gearing en pari-passu

-

-

-

3.2 Utilisation des revenus d'exploitation en diminution du montant à financer

Utilisation des revenus ? (oui:1 ; non:2)

2

2

2

% d'utilisation des revenus avant

-

-

-

Taux (1 : proportionnel / 2 : actuariel)

1

1

1

Taux d'intérêts - Tranche 1 (%)

-

-

-

Taux d'intérêts - Tranche 2 (%)

-

-

-

Taux d'intérêts - Tranche 3 (%)

-

-

-

Taux d'intérêts - Tranche 4 (%)

-

-

-

Taux d'intérêts - Tranche 5 (%)

-

-

-

Marge - Tranche 1 (bps)

350

350

350

Marge - Tranche 2(bps)

-

-

-

Figure 5 - Screenshot of the input sheet of one of the financial models

Table 3 - Example of one of the sets of sensibilities developed for one of the power plants

Scenarios	IRR	ADSCR min
Base Case	8%	1.052
Revenues during PPA duration only	6.75%	1.07
Revenues -5%	7.79%	0.73
O&M during operation (+20%)	7.81%	0.84
Lifecycle costs (+20%)	7.89%	1.01
Supply costs (+20%)	7.78%	1.01
SPV Costs + 50% year 2 & 3	7.95%	1.02
SPV Costs +€100k	6.67%	0.77
O&M + SPV Costs +20% during operation period	7.80%	0.78
Combined (O&M costs +10%, Revenues -5%)	7.75%	0.48
Inflation +1%	8.00%	1.04
Inflation -1%	8.18%	1.06
Insurance costs + 200% year 2 & 3	7.94%	0.93
Insurance costs +100%	7.62%	0.99
Waste revenues (-50%)	7.64%	1.01

This transaction was vastly interesting due to the fact that not only were there 6 plants with 6 completely different strategies to model, but also that:

- 3 of them were to be evaluated and acquired (brownfield plants, already under construction or operating, as opposed to greenfield plants, which are still to be designed and built from the ground);

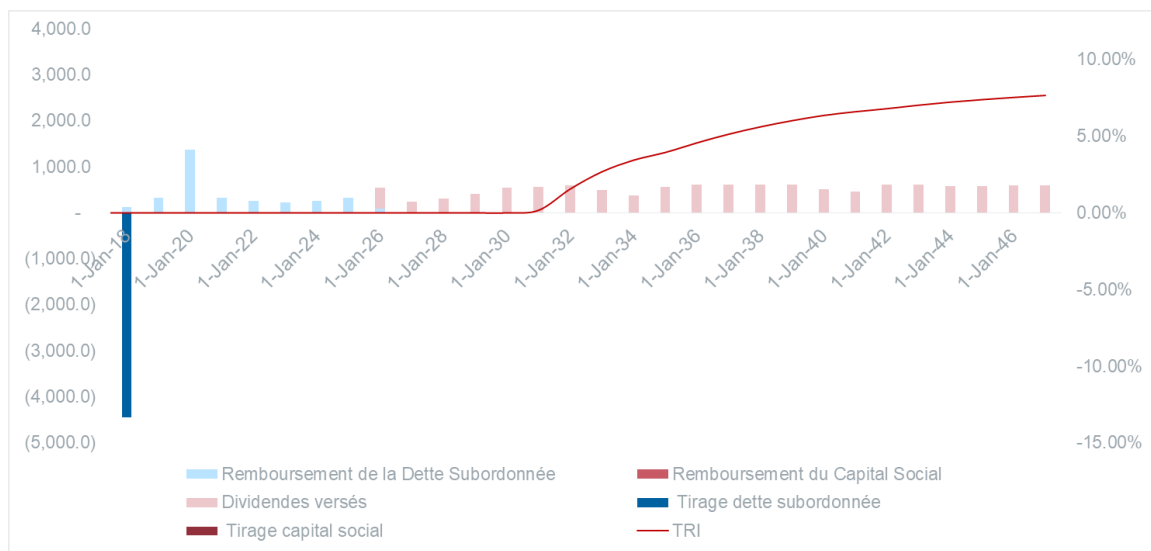


Figure 6 - Post tax junior funds IRR and the cashflows of one of the acquired plants

- The transaction comprised the acquisition of part of Evergaz's shares, meaning that all of the company's assets and subsidiaries had to be evaluated and priced;

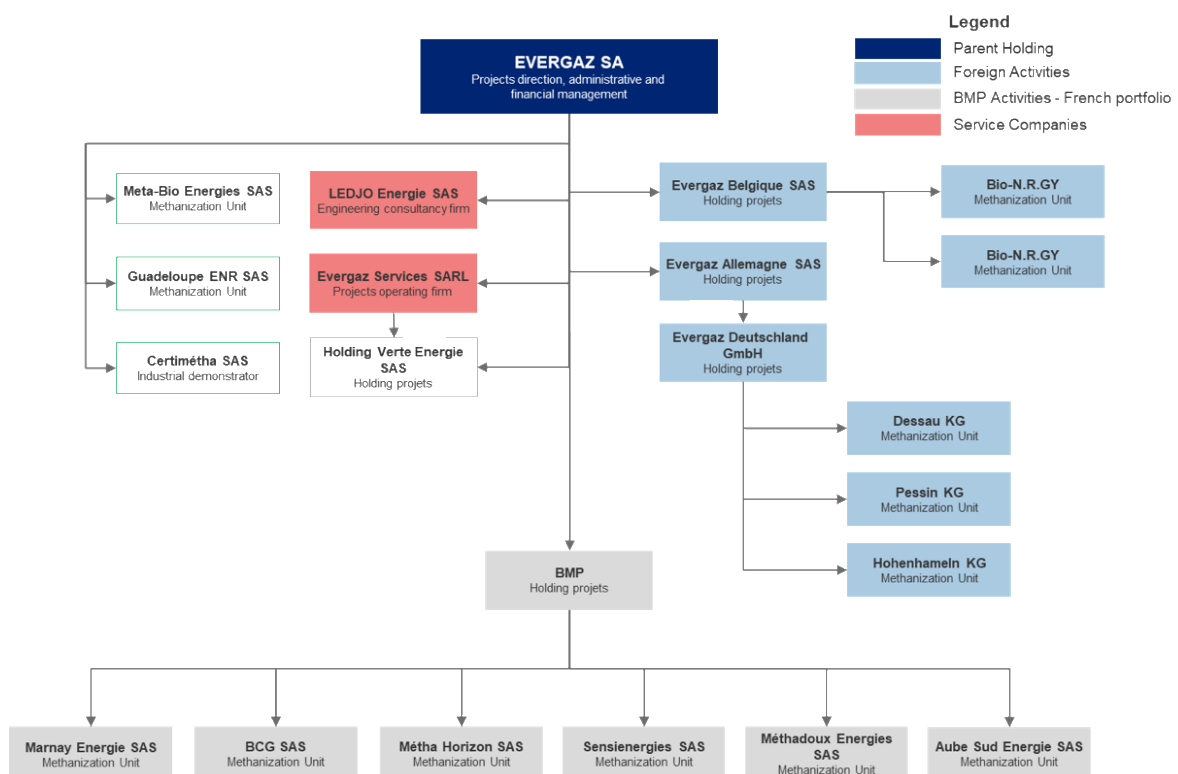


Figure 7 - Evergaz's assets and subsidiaries

- The acquisition of part of Evergaz's pipeline of biogas power plants was also included, being the projects to come evaluated along with the remaining components.

The transaction was, therefore, a huge challenge for me as one of the projects I was first assigned to and due to the very tight schedule we had.

### **Preparation of the internal and investors' presentations**

As shown in Figure 4, there are numerous stages before the final approval of a project in Meridiam. This project was to submit the settlement meeting presentation when I was assigned to it.

Along with the financial modelling and the due diligences, I was responsible for drafting and updating the Settlement meeting presentation and for the drafting of the IC paper.

## 6. Micro Pumped Storage Power Stations in The Martinique

### 6.1. Introduction to the project

#### Project background

Martinique is one of the least developed French overseas departments in the use of renewable energies, with 93% of the electricity still being produced by fossil sources. Not only is the energy not clean, the electricity network is not efficient. The times of breaks are outstanding in the Martinique, adding up to 103 days in 2011.

With the “Grenelle de l’environnement”, France has committed to a vast plan for the energy autonomy of the overseas territories. For the Martinique, the plan is to achieve, by 2020, 50% of renewable energy in the final consumption and, by 2030, energy autonomy.

In that context, Meridiam was approached by an engineering French company specialized in the development of energy storage facilities, for the development of a portfolio of micro Pumped Storage Power Stations (“PSPS”) in the French overseas territories, and thus, the financing of the first project of the platform in Saint Pierre, in the Martinique Isle.

The company has already developed an advanced pipeline of PSPSs to be deployed over a three-year period comprising the Saint Pierre project in the Martinique and two other projects in the French Overseas Territories’. All projects are expected to benefit from the support of the French energy regulator (Commission de Régulation de l’énergie “CRE”) through a 30-year contract with EDF SEI with a fixed feed-in tariff.

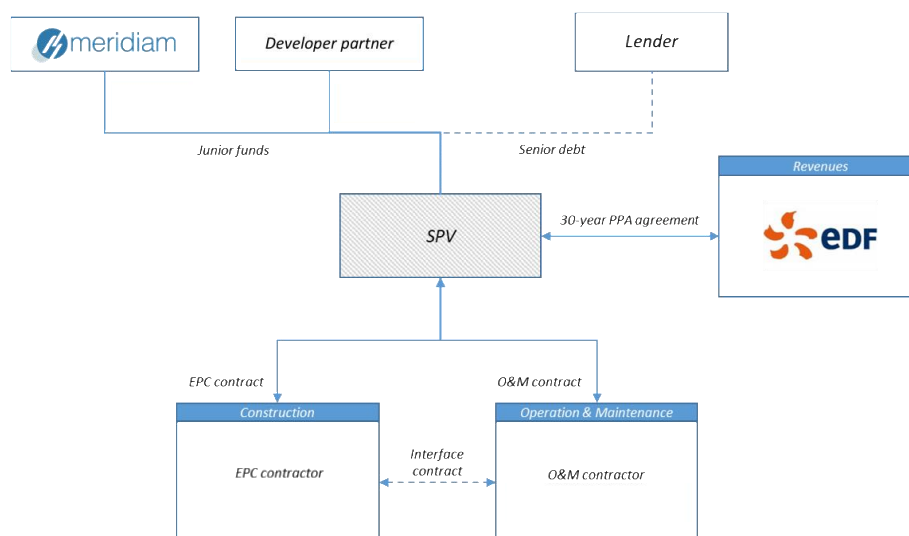


Figure 8 - Contractual Structure for Saint-Pierre's Project

## **Technology**

The Saint Pierre project is a 7.2 MW PSPS comprising two reservoirs of 25,500 m<sup>3</sup>, producing electricity during peak hours (4.5 hours /day) and contributing, therefore, in the balance of the supply and demand of energy in the Martinique.

Pumped hydroelectric storage provides a load during high demand hours, enabling additional system peak capacity.

The first use of pumped storage was in the 1890s in Italy and Switzerland. In the 1930s reversible hydroelectric turbines became available.

The most important use for pumped storage has traditionally been to balance baseload power plants but may also be used to abate the fluctuating output of intermittent energy sources. It is particularly likely that pumped storage will become especially important as a balance for very large-scale photovoltaic generation.

Technology benefits include:

- High storage capacity: Pumped hydroelectric storage is, along with Compressed Air Energy Storage (“CAES”) and hydrogen batteries, one of the highest capacity energy storage solutions, allying to that a very high power and the longest lifetime of all systems.
- High efficiency: Pumped hydroelectric storage has outstanding efficiency, varying from 65 to 85%, comparable only to low power and capacity energy storage systems.
- Safety: Pumped hydroelectric storage is the only high-power energy storage system that does not present explosion or fire risks. This means that this would be the safest solution to be integrated in rural and urban regions, thus being closer to the power grid.
- Cost effective: Pumped hydroelectric storage technique is currently the most cost-effective means of storing large amounts of electrical energy and being capital costs.

## **6.2. Role in the project**

### **Financial modelling**

I was assigned to the project at the very beginning of its development, meaning that I was responsible for the development of the first financial model and, with the evolution of the

partnership, also for due diligences and troubleshoot the advisor’s models, developing and running scenarios and sensibilities for the plant and possible additional plants in other French Overseas Territories.

Two main scenarios were being considered by the time my internship was over: a full equity investment and an investment based on a [50:50] gearing (meaning that it’s financed by 50% debt and 50% of equity and quasi-equity).

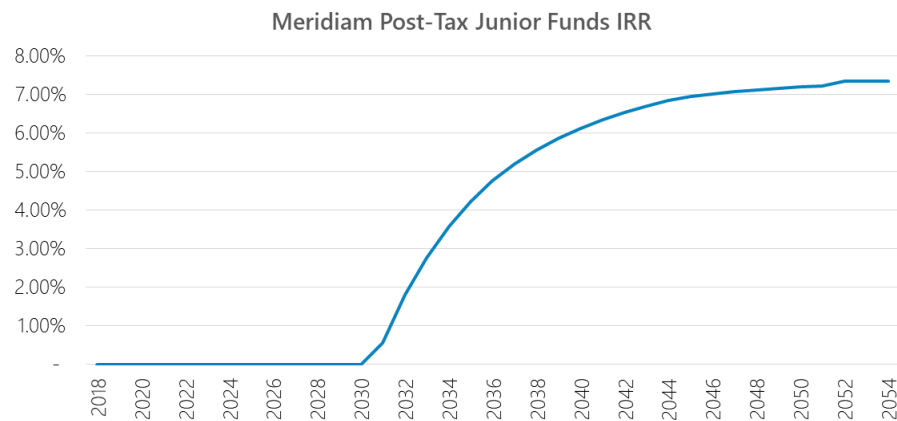


Figure 9 - Forecasted Meridiam Post-Tax Junior Funds IRR under a Full Equity Scenario

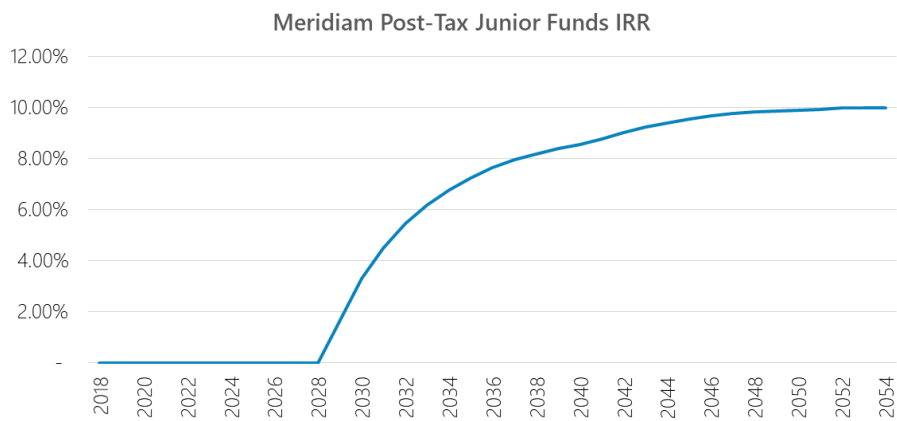


Figure 10 - Forecasted Meridiam Post-Tax Junior Funds IRR under a [50:50] Gearing Scenario

Table 4 - Sensitivity Table (including internal rate of return and minimum debt service coverage ratio<sup>3</sup>)

Scenarios	Full Equity Scenario	50/50 Gearing Scenario	
	IRR	IRR	ADSCR Min
Base Case	7,40%	10,05%	1,76 x
Revenues - 0.5%	6,82%	9,21%	1,54 x
O&M and SPV costs during ops. + 20%	6,92%	9,24%	1,66 x
Lifecycle costs + 20%	7,38%	10,02%	1,74 x
SPV costs + 50% year 2 & 3 within €/[\$500k-1m]	7,27%	9,78%	1,76 x
Unplanned Lifecycle year 5 & 6 [10% total lifecycle eq.]	7,36%	9,97%	1,76 x
Combined (All Costs +10%, Revenues - 0.5%)	6,56%	8,75%	1,48 x
Inflation + 1%	7,64%	10,42%	1,86 x
Inflation - 1%	7,18%	9,71%	1,67 x
0% interest income on cash reserves	N/A	N/A	N/A
Insurance costs + 100%	7,16%	9,64%	1,71 x
Insurance costs + 200% year 2 & 3	7,12%	9,44%	1,76 x

## Preparation of internal and investors' presentations

I was assigned this project right after the launch of its TIR (refer to Figure 4). By the time my internship was over, the project had passed pre-closing IC phase, meaning that I participated in the development of the Kick-off presentation, the Settlement meeting and the pre-closing IC paper.

## Responsible for the conduction of the meetings with the financial advisor

As my internship developed, more defying tasks were assigned to me, such as the participation and, later on, the conduction of meetings and calls with advisors and partners. In the Micro Pumped Storage Power Stations Project, I had already had some experience in

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<sup>3</sup> DSCR: Debt Service Coverage Ratio, is the ratio between a period's (usually 6 months) Net Operating Income and its Debt Service. It's a measure demanded by banks, with a minimum tax being defined as a safety measure for the lender.



meetings, preparing notes, reports, catch ups and to-dos following them. For that reason, I was assigned the lead of meetings with the financial advisor (a company that's contracted to develop the final financial model in accordance with the tax and accounting advisor's inputs).

This was a particularly challenging task for me, since the meetings were conducted in French with native French speakers most of the time, all more experienced than me in the subject of financial modelling. I've conducted around 5 meetings and some 10 calls with the advisors until we had our final financial model.

## 7. Conclusion and personal review

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This internship was for me the opportunity to have a first and very positive experience in the field of project finance.

Meridiam offers trainees and interns an excellent opportunity to learn and train as an analyst, a true express course on the subject, especially valuable since almost all the team has an engineering background. The integration of the trainee is supported by other analysts who gladly and openly pass on their knowledge, the result of this friendly and cooperative ambient is a big integration of the teams, an incredibly light work environment and a proactive and dedicated team.

Thanks to the trust of the Meridiam team, I was able to participate in several projects at different stages of their development, from identifying opportunities to financial closing. The experience was as complete as it could be for a 10 months internship: I had the opportunity to work alongside people with exceptional background and outstanding human touch. My expectations were by much surpassed.

As hard skills I could name learning how to finance a project in the form of a PPP or a concession, as well as PPA<sup>4</sup> agreements; produce, evaluate and analyze outputs of financial models; analyze and draft changes to contracts (within a consortium and with clients, advisors, procurers and contractors). I also became aware of the useful financial elements for optimizing financial structuring, such as subordinated and senior debt and equity.

At the inter-relational level, I have improved my ability to communicate with people from different backgrounds in a multicultural environment, both in English and, notably, in French, in most of many different situations the analyst is required to (with co-workers, partners, advisors and grantors).

For the beginning of my internship, I mostly trained my abilities in preparing my first financial models and ad-hoc internal reports, it took me around 3 to 4 weeks to get in a project team. As

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<sup>4</sup> Power Purchase Agreements: agreements made with public utilities organs for the procurement of energy, very common among renewable energy projects in Europe.

time went by, my co-workers kept giving me more complex and interesting tasks as I went up in skills, the environment was always challenging and instigating.

During my internship I've faced many hard situations, many seemingly unsurmountable deadlines and challenges, but exchanging with people with more experience and asking for help, made me be able to tackle all of those with head high. I've confirmed my motivation to participate in large-scale engineering projects through finance project over and over again after each obstacle.

For my professional project, I would like to work in infrastructure in more politically difficult countries, such as in Africa, Latin America or East European countries. More specifically, I am interested in infrastructure development in poorer countries, which pose a much bigger challenge for investors, which could lead me to later develop projects in Brazil, my home country. The current political, economic and social situation is indeed favorable to the setting up of such projects, Brazil is going through one of the biggest recessions after years of statist governments, with elections indicating a future turn of table, representing a big opportunity for the development of public-private partnerships, which have already started.

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