Innovative financing structure for large scale SAF Projects

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Introduction

Achieving decarbonization targets in Europe alone and complying with underlying policies will require considerable expansion of industrial-sized sustainable liquid fuel production capacities. By 2035, investments of over €50 billion will be needed in novel production facilities (biofuels and e-fuels). For e-fuels, additional investments in hydrogen production, carbon capture and renewable electricity are required, bringing the cumulative amount needed until 2035 to between €200 billion and €300 billion for Europe alone[1].

Despite growing interest in green hydrogen and in particular Sustainable Aviation Fuel (SAF) worldwide, securing long-term investments across its value chain remains a significant challenge. Banks and institutional investors remain cautious due to perceived risks, uncertain returns, and regulatory gaps, particularly in developing countries. The investment landscape is evolving, with traditional financiers like banks and insurance companies no longer the sole players. Specialized fund managers, private credit firms, hedge funds, and private equity giants are emerging as key funding sources. However, these investors require well-structured financial instruments with clear risk mitigation strategies to ensure confidence in their capital commitments.

At this stage SAF projects do not meet investor's triangle (risk/return/ liquidity) expectations. Investing money into a SAF project means high risk, low liquidity and not adequate returns.

With this article I would like to stimulate a discussion about an innovative finance structure called "Project Backed Security". It consists out of a managed portfolio approach and guarantees to efficiently influence the risk and liquidity profile. This would potentially significantly increase attractiveness for investors. The smart utilization in favor of guarantees instead of grants will limit potential negative effects on Governments balance sheet.

Financing requirements through the development cycle

Developing a SAF project take several years and starts with a pre-feasibility phase. After the pre-feasibility phase has been successfully finalized, the project enters into the feasibility phase, followed by Front End Engineering Design (FEED) and finally construction phase. In each of these phases the developer needs specific financing to meet the requirement of that phase and proceed into the next phase. After the FEED phase the project is entering into the Final Investment Decision (FID). Figure 1 illustrates the different phases of a typical project cycle and indicates the different types of financing a project needs at certain points of the development cycle. In this article I will focus on an innovative financial instrument for FID. It will not cover financing needs for the other phases shown in Figure 1, in particular financing feasibility studies, working capital or finding a strategic equity partner etc.

1 Financing sustainable liquid fuel projects in Europe, EIB 2024

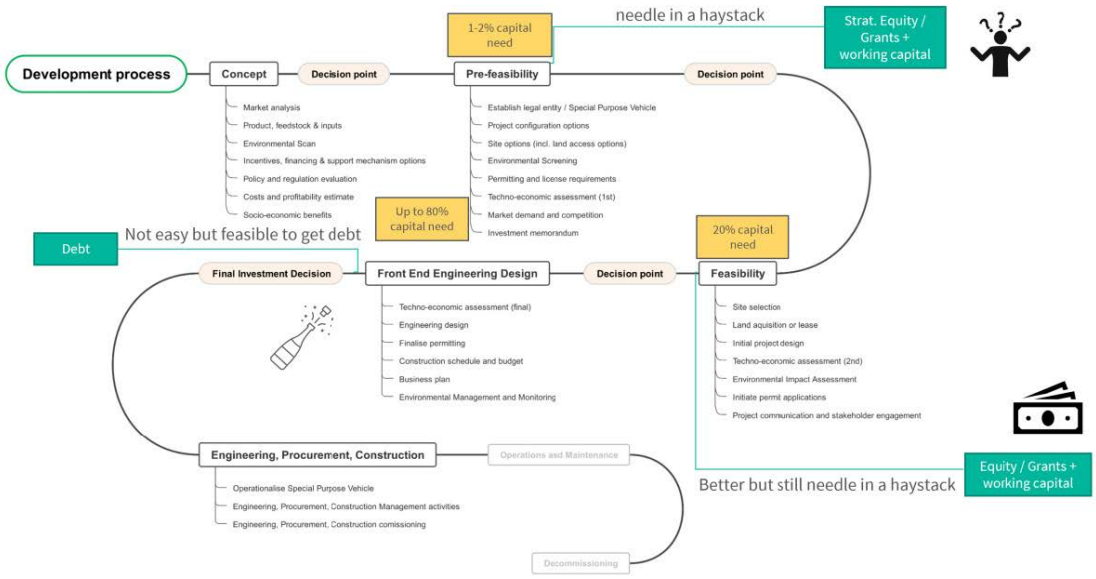

FIGURE 1: different phases of a typical project cycle.

Availability of risk capital

According to Wood Mackenzie[2] the Venture Capital inflow to climate tech has **decreased** by **14%** in 2024 compared to 2023. However **28% rise** in carbon removal technology (mainly driven by the USA) and **28% decline** in equity investment in decarbonizing high emitting industry. It appears that Investors see currently a better risk return profile in evolving industries like Artificial Intelligence (AI). However, specialists funds are on the rise as expertise in the topic becomes more relevant for investment decisions.

Generally speaking, there is sufficient capital available looking for investment however, the risk/return profile of the SAF projects are not competitive enough compared to other investment options like AI. So investors prefer to invest in other projects with a favorable risk/return profile. Overall SAF projects risk-return profiles make final investment decisions difficult even if projects are mature[3].

Changing the risk/return profile of SAF projects would increase competitiveness towards investors investment decission.

Government Guarantees to lower the overall risk profile

Treatment of guarantees for balance sheet purposes can be different in each country. In many cases guarantees are recorded on countries balance sheet as contingent liabilities, reflecting the potential obligation of the government to fulfill them if the borrower defaults. The recognition occurs when there is a significant likelihood that the guarantee will be called upon.

The accounting treatment of guarantees can affect the overall financial position of the government, influencing budgetary decisions and fiscal policies. If recognized as liabilities, they will appear on the balance sheet, impacting debt levels and fiscal ratios.

However, guarantees are a more attractive option to de-risk a SAF project than e. g. grants.

Guarantees play a crucial role in project finance by providing additional security to lenders and investors, thereby facilitating the funding of large-scale projects. Usually a guarantee is provided for a specific purpose like credit

2 Hydrogen: 5 things to look out for 2025, Wood Mackenzie December 2024
3 Financing sustainable liquid fuel projects in Europe, EIB 2024

guarantee, performance guarantee to mitigate risk or lower cost of capital.

Guarantees embedded in a waterfall structure like shown in Figure 1 would serve as a first loss piece covering all types of risks. Depending on the size of the guarantee the risk profile of all tranches (Equity, Mezzanine, Senior) can be influence in order to achieve the desired risk/return profile. The guarantee will become the centralized de-risking mechanism and ultimately works as a credit enhancement.

Pooling of lighthouse projects as a measurement of risk diversification

The World Bank's lighthouse projects focus on innovative initiatives that promote sustainable development, particularly in areas like sustainable aviation fuels (SAF). The rational behind the lighthouse selection is to focus the World Bank and global effort on a few but most promising SAF projects to ensure FID and kick off SAF production on large scale.

Translating the lighthouse idea into financing means bundling lighthouse projects into one portfolio and manage from an investor perspective the projects as a portfolio. This portfolio approach would lead in itself to a risk-diversification of SAF projects in terms of country risk, specific risks and technology risk.

Food for thoughts: Managed Project Backed Security (PBS)

Asset Backed Securities (ABS) are a well known financial instrument in the financial world. It started in 1970 in the US with a so called Ginnie Mae the first mortgage-backed security (MBS), which pooled residential mortgages and sold them to investors.

Within the financing of renewable energy so called Solar Panel ABS (Solar ABS) play a vital role in financing renewables. Solar ABS are financial instruments backed by the cash flows generated from solar energy systems — typically through leases, loans, or power purchase agreements (PPAs) with residential or commercial customers.

Similar to Solar plants a SAF plant or PtL plant generates cash flows from selling the fuel into the market via a fuel purchase agreement or also known as off-take. This expected cash flows will be the "asset" which backs the security (similar to Solar ABS) of a SAF ABS or PBS.

A typical ABS consists out of several tranches with a waterfall structure. The waterfall structure dictates how cash flows are distributed to the different groups of investors, known as **tranches**. The highest priority tranche is the senior and the lowest is the equity tranche (Figure 2).

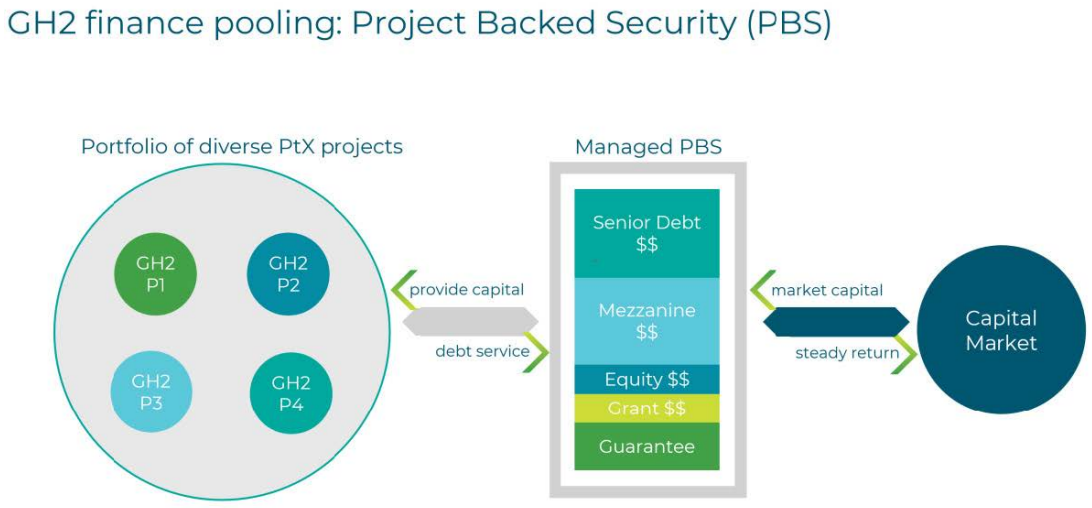

FIGURE 2: GH2 finance pooling: Project Backed Security (PBS).

The idea of the PBS is to add tranches below equity namely grants and guarantees to increase credit quality of the above tranches to a level, it becomes attractive to invest in for a broad range of investors in the capital market.

Combining the concept of pooling lighthouse projects into one managed portfolio with a managed PBS and guarantees to booster the credit quality of the tranches could become next generation of financing instruments for lighthouse SAF projects.

PBS could be a powerful tool in SAF finance. They help accelerate the adoption of clean SAF while offering investors a sustainable, long-term investment opportunity. As the world shifts toward decarbonization, PBS might playing an increasingly important role in connecting capital markets with climate solutions like SAF.

Such a PBS would also further contribute to the ICAO Finvest Hub. The identified "lighthouse" SAF projects through Finvest Hub could be a basis for building a relevant portfolio and also supporting the ramp-up of managed PBS.