4.5/ Almada's Climate Fund

4.5.1/ Almada's Internal Contracting scheme at a glance

KEY FIGURES
City surface: 76 km²
Inhabitants: 169,700
Municipal building stock:
357 facilities
Total surface area: 130,000 m²

Energy Consumption (2015):
Electricity: 26,000 MWh
total energy cost: €4.5m

REVOLVING FUND
Size of revolving fund: €500,000
Ratio Seed Fund to annual energy cost: 10%
Number of measures implemented: 3 (65 with previous fund)
Investment covered: €58,000

Special features of the Internal Contracting in Almada

In 2009 the "Almada Less Carbon Climate Fund" was setup. It aimed to reduce Almada's carbon footprint by financing energy efficiency and renewable energy investments. After the first seven years of successful operation, and leveraging over € 1.5m of investment for energy efficiency and renewable energy, in 2016 it became a revolving fund.
The most important innovation of the fund is the 'shared benefits' approach which encompasses different sharing schemes linking the fund and the "client department" based on the characteristics of the project. This ensures that the fund is replenished and gives extra motivation for different departments to invest in energy efficiency projects. It is also important to ensure monitoring of the measure since a non-compliance procedure is included, and the client departments can lose the shared benefit or even have a penalty imposed on their budget if they fail to operate the system correctly.

4.5.2/ Almada's Climate Fund (r)evolved

Almada's Local Strategy for Climate Change contains a number of measures targeted at reducing the energy consumption of buildings and the transport sector. To support these measures, the "Almada Less Carbon Climate fund" was created in 2009 and it is supported by a specific budget line for energy efficiency and renewable energy investments dependent on an evaluation of the CO_2 emissions from the municipal activities from the previous year (not a compensating mechanism but linking and making the connection between emissions, energy and investment). It supports local energy efficiency investments, serving as a benchmarking instrument for the measures of other key players in the mitigation of GHG emissions, from both the public and private sectors.

After seven years of successful operation, the fund is now being redesigned and upgraded to become a revolving fund. This means that the cost savings resulting from implemented energy efficiency measures will be returned directly to the Fund, ensuring leverage of the fund and boosting further investments in a clean energy transition. This new development is summarised in the image below:

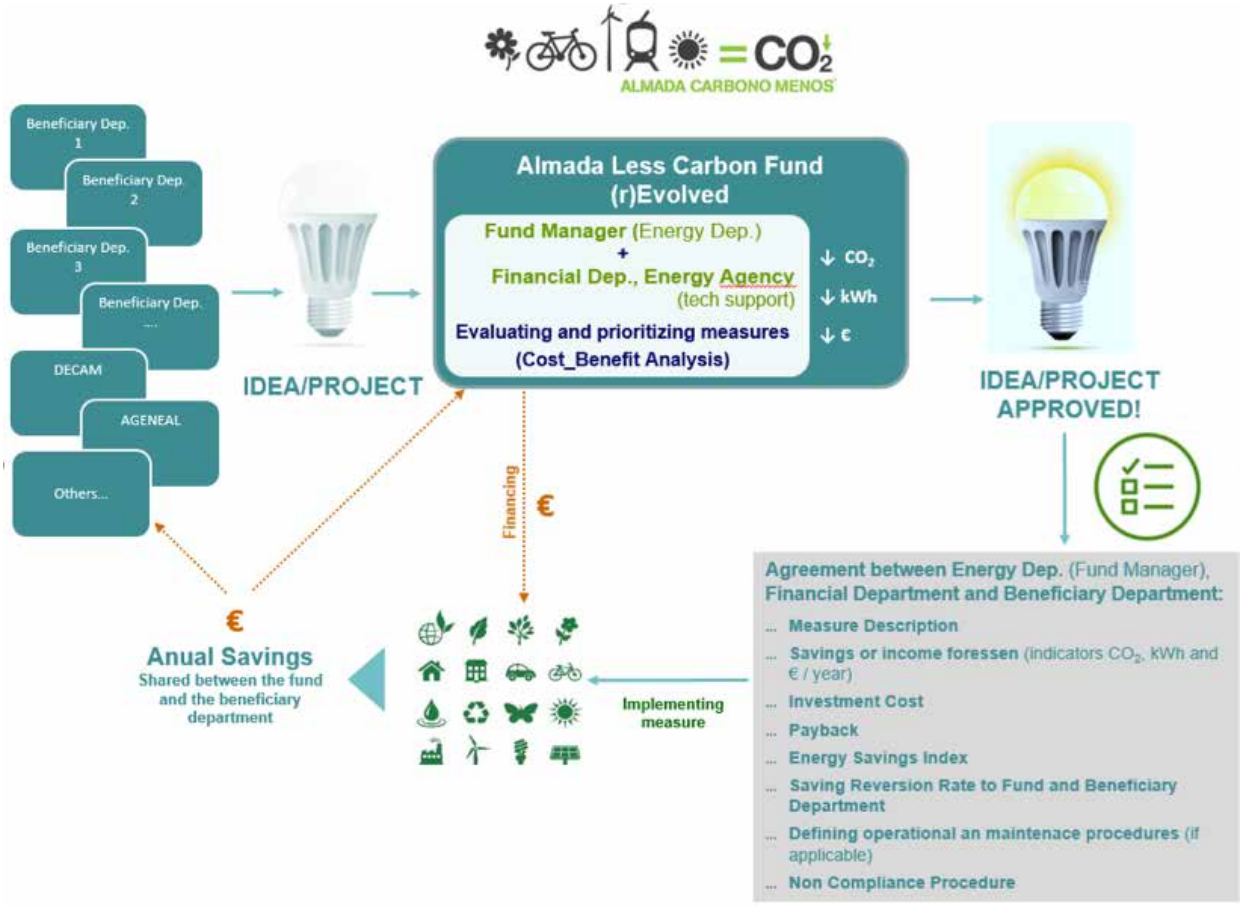

Figure 27: Almada Less Carbon Fund's business model

The most important innovation of the fund is the 'shared benefits' approach which assumes different sharing schemes between the fund and the "client department" based on the characteristics of the project. The main assumptions and objectives are to ensure the sustainability and a leverage effect of the fund, automatically prioritising the most cost-efficient projects, and to directly benefit the "beneficiary department". This will be done by increasing the budget of the "client department" on year+1 investment and increasing the fund in a shared proportion in line with the savings. The need to directly benefit the "client department" comes from the fact that the energy bills are paid for by the financial department and not directly by the "client department's" budget. Conversely, the financial department will see its budget decreased in the same proportion as the savings.
For a project with a very high return on investment the proportion of savings to the fund and client department will be 50/50 until the end of the project lifetime. This ensures that the fund is reimbursed and gets extra funds if the payback time is small and the project lifetime is longer.

The basic idea of the scheme is to maintain the initial structure to ensure continuity of the existing mechanism and financial flows, whilst including a revolving procedure. In order to build upon the work already developed and also to minimise risks from projects where energy savings do not generate large amounts of savings in monetary terms, a hybrid solution has been developed. This solution uses the existing mechanism but mimics the inflow to the fund of energy savings and an outflow to "client departments" based on the result of the projects. Everything is based on the same dedicated budget line for the fund which is used exclusively for energy efficiency and renewable energy investments.

4.5.3/ Core Team

The core team of Almada's Climate Fund functions within a four layered framework:

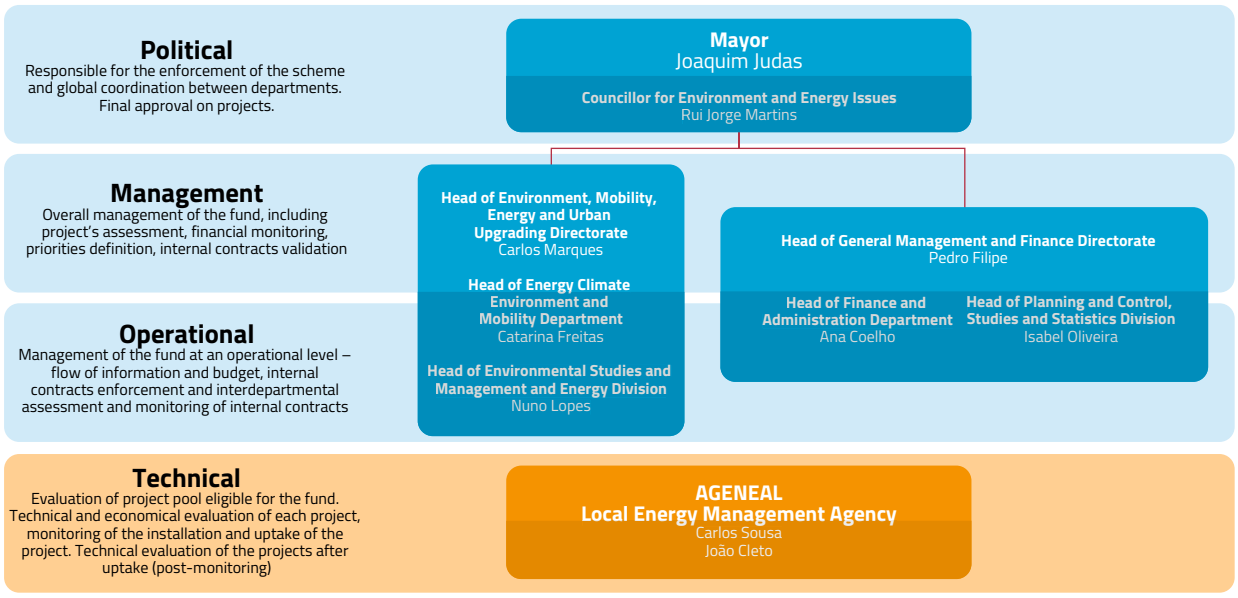

Figure 28: Core team of Almada's Climate Fund

4.5.4/ Legal Organisation and fund characteristics

Operation of the revolving fund will be based on the following pillars:

- Internal procedure which includes an analysis of energy bills, energy audits, an agreement on implementation of measures, investment and annual monitoring.
- Internal performance agreement which includes an energy savings index, the benefits sharing scheme, the duration of the financial flows and the definition of the non- compliance procedure. The agreement is signed between the fund managers and the client department (any department of the municipality).
- **"Shared benefits approach"** Energy cost savings are monitored and centralised by the financial department which pays the beneficiary department.

The standardised internal procedure is made via a five-step approach according to the following information flow:

- **Step 0**: Energy Bill/Energy Audit > Proposal of measures and cost benefit analysis – CO_2, kWh, € (Energy Agency + Energy Department +Financial Department) – check partial or total funding. The "Client Department" can suggest measures.
- **Step 1**: Agreement on the implementation of measures > Energy Department +Financial Department and "client department"
- **Step 2**: Agreement signature > includes definition of measures, expected savings, Payback Period, Energy Savings Index, Benefits Sharing Scheme, penalties for non-compliance
- **Step 3**: Investment made by climate fund
- **Step 4**: Monitoring of measure and annual evaluation

The internal contract is agreed upon with all the departments and has the following structure:

- **Measure**: Definition of measure, expected savings (kWh, €, CO_2), payback time, lifetime -
- **Energy Savings Index**: Based on lifetime/payback time ratio, which should be bigger than 1 (evaluate exceptions for ancillary benefits, pilot projects, opportunities)
- **Benefits Sharing Scheme**: Percentage of savings going to fund (X) and to client department (Y). The greater the energy savings index the higher the percentage to the client department.
- **Financial Flows**: Budget for year+1 increased by X to the fund, Y to client department and –(X+Y)=Z to the financial department.
- **Duration of finance flows**: Lifetime of measure – ensure refunding and leveraging of the fund
- **Non-compliance procedure**: Requirements for operation defined. If "client department" does not operate correctly no compensation for year of faulty procedure. If faulty procedure persists, a penalty will apply to the following year's budget (-X).

To calculate the above parameters one should take into account that the following:

- Forecast energy savings and/or revenues from the measure (€/year) - **PT**
- Investment Cost (€): **I**
- Payback time (years): **[PRS = I/P]**
- Energy savings index: **[FEE = lifetime of the measure/PRS]**
- % of savings paid to the fund: **[TRF = 1/FEE]** - The percentage of savings paid into the Fund is in inverse proportion to the energy savings index. The lower the index, the greater the % paid into the Fund, limited to a maximum of 95% and a minimum value of 50%;
- % of savings paid to the beneficiary department: **[TRB = 1 - TRF]**

The financial flows affecting the departments' budgets in the years following the implementation of the measure are calculated as follows:

- **Financial Department Budget**: - PT PT are the forecast energy savings and/or revenues from the measure. The financial department will not have to pay this part of the energy bill, so the budget can be reduced.
- **Client Department Budget**: + PB (preferable on budget line dedicated to investment) PB is the savings in € paid to the beneficiary department budget and equals PT x TRB
- **Energy Department (Fund Manager)**: + PF PF are the savings in € paid to the beneficiary department budget and equal PT x TRF Note: PT = PB + PF

These values will be repeated until the end of the number of years of useful life of the investment: the greater the number of years of useful life of the investment and the lower the payback time, the greater the potential repayment and leverage of the Fund.

This procedure may seem complicated, but looking at the specific example of Exterior LED lighting on the Modern Art Museum (implemented in 2016) makes quite clear how all the flows work:

Data for the measure

Beneficiary	Investment (I)	Savings (PT)	Lifetime (v.u.)	Payback (PRS)	Energy Savings index (FEE)	% savings to the fund (TRF)
Cultural Department	€11,000	€6,360	10,0	1.7	5.8	50%

Annual Financial flows (from 2017 over project lifetime)

Year	To the fund (PF)	To the Culture Department (PB)	From the Financial Department (-PT)
2017	€3,178.29	€ 3,178.29	€- 6,356.57

4.5.5/ Measures in the pipeline for testing in 2016/2017

In 2016, a set of three measures were selected as frontrunners for a test of the revolving fund scheme in Almada:

Contemporary Arts Museum - Casa da Cerca – Exterior LED Lighting

Energy Savings	48,270 kWh/year	☺☺☺
Savings	6,275.14 €/year	☺☺☺
Avoided Emissions	18,825 kg CO_{2eq}/year	☺☺☺
Investment	€ 12,364.59	☺
ROI	2.0 years	☺☺

Several municipal facilities – power factor correction

Energy Savings	248,333 kVArh/year	☺
Savings	13,316.00 €/year	☺☺☺
Avoided Emissions	N/A	
Investment	€ 19,370.00	☺
ROI	1.5 years	☺☺☺

Parque da Paz - Solar Photovoltaics and Solar Hot Water

Energy Savings + Production	23,366 kWh/year	☺☺
Savings	2,747.15 €/year	☺☺
Avoided Emissions	6,243 kg CO_{2eq}/year	☺
Investment	€ 26,165.00	☺
ROI	9.5 years	☺

Figure 29: Solar thermal installations in Parque da Paz

The amount of money available each year still means that other measures can be included after the test phase. Some of them have already been quantified, studied and will be implemented. They include:

- Public Lighting: Expanding the point to point remote control system, flow reduction with remote control at branch level (groups of light points instead of point to point), flow reduction with multilevel electronic ballasts and LED lighting replacement
- Innovation, energy efficiency and renewable energies in public buildings, schools and social housing stock
- Electric vehicles for the municipal fleet
- Photovoltaic projects of a significant scale, mini-production or photovoltaic energy production centre
- Efficient lighting in historical monuments.

More information

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