

­­­­

**[Name of the Project]**

[City, Lebanon]

[Day, Month, Year]

*Important Notes:*

***1. All sentences written in italic format in this template are for instructions purposes only. These sentences should be removed from the project proposal.***

*2. This project proposal template is for instructional purposes. It is designed to help potential beneficiaries, consultants, and contractors in preparing comprehensive technical reports and proposals about energy efficiency and renewable energy projects implementation.*

*3. This project proposal template is a mandatory requirement towards facilitating the green loan application process through the national financing mechanism NEEREA.*

*4. This project proposal template is prepared by the Lebanese Center for Energy Conservation- Technical Support Unit to the Central Bank of Lebanon, and is available for public use.*

*5. The Technical Support Unit to the Central Bank of Lebanon at the Lebanese Center for Energy Conservation (LCEC) is supported by the European Union (EU).*

*6. For questions, clarifications, or suggestions, please contact the LCEC: 01-569101 or by email:* [*energy@lcec.org.lb*](mailto:energy@lcecp.org.lb)

Technical Proposal for the Loan Request Pertaining to:

*[Name of the Project]*

*[City, Country]*

Submitted as Part of the Loan Request under the Central Bank of Lebanon (BDL) National Financing Mechanism NEEREA

Submitted for Review by the Technical Support Unit to the Central Bank of Lebanon at the Lebanese Center for Energy Conservation (LCEC)

Proposal Prepared by: *[Name of the Person or Company]*

Project Owner: *[Name of the Owner]*

Date: *[Day, Month, and Year]*

**Project Owner’s Statement:**

I, the undersigned, Ms./Mr. *[full name]* hereby declare that I have read and accepted this project proposal prepared by *[name of the proposal writer]* and affirm that all the recommendations mentioned in this report meet all my technical and financial terms and criteria and they are up to my satisfaction.

Signature and stamp (if applicable) of the client and date

*[Name and stamp (if applicable)]*

1. Proposal Contents

1. Proposal Contents

2. Contact Details of Involved Parties

2.1 Project Owner Details

2.2 Consultant Details

2.3 Bank Details

2.4 Product Suppliers Details

3. General Description of the Current State of the Facility

4. Narrative Description of the Proposed Project

4.1 Rationale and Objective

4.2 Presentation of the Proposed Project

5. Loan Request Summary Sheet

6. Financial Analysis Summary

7. Current Situation of Energy Consumption

7.1 Energy Consumption by the facility

7.2 Site Energy Balance

8. Detailed Feasibility Study of the Project

8.1 8.2 8.3 *[Insert Name of Measure 1, 2, 3]*

8.4 Example 1: Lighting Energy Efficient Solution

8.4 Example 2: Boiler Energy Efficient Solution

8.5 Example 3: Compressor Energy Efficient Solution

8.6 Example 4: Building Envelope Improvement

8.7 Example 5: Solar Water Heaters System

8.8 Example 6: Solar Photovoltaic System

8.9 Benefits of All Implemented Solutions

8.10 Economic and Financial Analysis

8.11 Environmental Sustainability Analysis

9. Catalogs and Data Sheets

10. Invoices and Quotations

2. Contact Details of Involved Parties

2.1 Project Owner Details

|  |  |
| --- | --- |
| Name: | [insert full name] |
| Full Address: | [insert street/ number/ town or city/ country] |
| Telephone/Fax numbers: | [insert telephone/fax numbers, including country and city codes] |
| Mobile Number: | [insert mobile number, including country and city codes] |
| E-mail address: | [insert e-mail address] |

2.2 Consultant Details (Proposal Writer)

|  |  |
| --- | --- |
| Name: | [insert full name] |
| Full Address: | [insert street/ number/ town or city/ country] |
| Telephone/Fax numbers: | [insert telephone/fax numbers, including country and city codes] |
| Mobile Number: | [insert mobile number, including country and city codes] |
| E-mail address: | [insert e-mail address] |

2.3 Bank Details

|  |  |
| --- | --- |
| Name of the Bank: | [insert full name] |
| Branch: | [insert branch name] |
| Name of the Bank Representative: | [insert full name] |
| Full Address: | [insert street/ number/ town or city/ country] |
| Telephone/Fax numbers: | [insert telephone/fax numbers, including country and city codes] |
| Mobile Number: | [insert mobile number, including country and city codes] |
| E-mail address: | [insert e-mail address] |

2.4 Product Suppliers Details *[if deemed necessary]*

|  |  |
| --- | --- |
| Name: | [insert full name] |
| Full Address: | [insert street/ number/ town or city/ country] |
| Telephone/Fax numbers: | [insert telephone/fax numbers, including country and city codes] |
| Mobile Number: | [insert mobile number, including country and city codes] |
| E-mail address: | [insert e-mail address] |

*[Add tables for product suppliers as needed: 2.5- 2.6- and so on]*

3. General Description of the Current State of the Facility

*[This section should offer a short description of the facility (residential building, commercial building, industry, house, etc.) including location, architecture, number of floors, and other useful information]*

*[This Section contains basic information about the condition of the premises at the time of contract execution. Such information would include facility area, construction type, use, occupancy, hours of operation, and any special conditions that may exist]*

*[Include photos and drawings if needed]*

4. Narrative Description of the Proposed Project

4.1 Rationale and Objective

*[This section of the proposal is dedicated to present the main objective of the energy efficiency or energy conservation project in the context of climate change and sustainable development]*

*[This section should be also used to present the rationale behind the project and its importance to the client]*

*[This section should also include the specific objectives of the project proposal]*

*[For example, it might be that the age of the facilities creates some challenges for modernization, the high ceilings and thick walls allow for opportunities not easily achieved in a more constricted setting. EDL cut-offs in Lebanon might be an essential need to use renewable energies such as Solar and for installing energy efficient equipments]*

4.2 Presentation of the Proposed Project

*[This section should include the proposed energy conservations measures (ECMs) to update the specific site by installing energy efficient or renewable energy systems within the site]*

*[This section should also explain how these measures complement each other and do not overlap]*

*[This section is also dedicated to inform about the focus of the project, the adopted steps and the projected on-site actions]*

*[For example, to achieve the project objectives, the following approaches will be used: On-site record of energy consumption, energy production and energy fed-in to the grid; solar water heaters will be installed; fluorescent lamps will be replaced by CFLs or LED lights]*

*[This section should include project planning and scheduling, as well as demonstrate the protection of owner’s sensitivity to quality, safety, and environmental factors]*

5. Loan Request Summary Sheet

A detailed summary of the proposed project is provided in this section in the table here below:

*[Name of the Project]*

|  |  |  |  |
| --- | --- | --- | --- |
| **Ref. No.** | **Description of the Solution or the RE/EE Measure** | **Total Amount (USD)** | **Amount Needed (USD)** |
| **1** |  |  |  |
| **2** |  |  |  |
| **3** |  |  |  |
| **4** |  |  |  |
| **5** |  |  |  |
|  | TOTAL AMOUNT OF THE LOAN REQUESTED FROM THE BANK (USD) |  |  |

*[List all solutions and renewable energy/ energy efficiency measures that constitute the different elements of the loan, including the cost of the study if needed]*

*[The total sum of the different measures should equal the total amount of the loan requested from the bank]*

*[Add additional rows for additional measures as needed]*

*[The description of the proposed solution or measure should be meaningful without being exhaustive]*

*[A list of potential solutions or measures related to energy efficiency is shown herewith for reference: interior lighting systems; exterior lighting systems; efficient ventilation systems; high efficiency motors; efficient pumping equipment; power factor correction; efficient heating systems and equipment; control systems on boilers; control systems on elevators; variable speed drives; cogeneration and heat recovery; building envelope applications; etc.]*

*[A list of potential solutions or measures related to renewable energy is shown herewith for reference: solar water heating; solar photovoltaic applications, geothermal applications, biomass applications, wind energy applications, etc.]*

6. Financial Analysis Summary

In addition to the information shown in the table in the previous section, the following table shows the annual cost savings in USD of each measure, as well as the calculation of the payback period per measure, and per the total amount of the loan.

*[Name of the Project] [Client’s Signature]*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ref. No.** | **Brief Description** | **Amount Needed (USD)** | **Cost Savings (USD)** | **Payback Period** |
| **1** |  |  |  |  |
| **2** |  |  |  |  |
| **3** |  |  |  |  |
| **4** |  |  |  |  |
| **5** |  |  |  |  |
|  | TOTAL AMOUNT OF THE LOAN REQUESTED FROM THE BANK (USD) |  |  | *[Insert Overall Payback Period of the Project]* |

*[List all solutions and renewable energy/ energy efficiency measures that constitute the different elements of the loan, including the cost of the study if needed]*

*[The total sum of the different measures should equal the total amount of the loan requested from the bank]*

*[Add additional rows for additional measures as needed]*

*[The description of the proposed solution or measure should be meaningful without being exhaustive]*

*[A list of potential solutions or measures related to energy efficiency is shown herewith for reference: interior lighting systems; exterior lighting systems; efficient ventilation systems; high efficiency motors; efficient pumping equipment; power factor correction; efficient heating systems and equipment; control systems on boilers; control systems on elevators; variable speed drives; cogeneration and heat recovery; building envelope applications; etc.]*

*[A list of potential solutions or measures related to renewable energy is shown herewith for reference: solar water heating; solar photovoltaic applications, geothermal applications, biomass applications, wind energy applications, etc.]*

7. Current Situation of Energy Consumption

*[It is stressed that each energy efficiency investment proposal should be studied according to its own particular circumstances. There are a number of 'Typical Sets of Measures' that should be considered when planning investments, the main ones will be the following, any additional measure needed for the technical study can be added]*

7.1 Energy Consumption by the Facility:

*[As the first step in the technical analysis is to perform the full load inventory with the real time measurements, this section of the proposal is dedicated to analyze the present situation and to introduce the main energy use of the facility]*

*[This section should include several sub-sections according to each type of energy used in the facility]*

7.1.1 EDL Energy Consumption Analysis:

*[This sub-section should provide minimum the twelve months consumption and cost of EDL electrical energy consumed in order to be used as an EDL energy baseline for the facility]*

*[Type of EDL subscriptions: low tension, medium tension or high tension; and tariffs must be provided in this section. EDL meter in Amps is also required]*

*[EDL bills must be attached in the appendices]*

7.1.2 Diesel Generators Energy Consumption Analysis:

*[This sub-section should provide minimum the twelve months consumption and cost of electrical energy by Private Diesel Generators or subscriptions in order to be used as an alternative energy baseline for the facility during EDL power failure]*

7.1.3 Thermal Energy Consumption Analysis:

*[This sub-section should provide analysis of the present situation of the thermal energy used by the facility. Monthly diesel consumption analysis should be provided at least over one year to present the energy consumption pattern]*

*[Add additional sub-sections as needed: 7.1.4 – 7.1.5 - and so on]*

The following summary table provides key figures on how the facility is consuming energy and to which main load category. It summarizes the total annual energy consumption.

*Breakdown of Energy Consumption*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Month** | **Electrical Energy (kWh)** | | **Thermal Energy (kWh)** | **Total (kWh)** |
| **EDL** | **Generator** |
| January |  |  |  |  |
| February |  |  |  |  |

*[Add additional rows for all months of the year]*

*[Graph of monthly energy consumption for the facility must be presented]*

7.2 Site Energy Balance:

*[This section will provide information about the total energy consumption of the site including all energy types. It will present electrical and thermal energy costs and the relevant description]*

*[The graph of the annual energy consumption of the facility must be included in this section]*

The below table present the monthly energy costs including all types of energy.

*Site Energy Cost*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Month** | **EDL** | | **Diesel Cost** | | | | | **Total Energy Cost** |
| **Boilers** | | **Generators** | | **Total** |
| **kWh** | **Cost** | **Liters** | **kWh** | **Liters** | **kWh** | **kWh** |
| January |  |  |  |  |  |  |  |  |
| February |  |  |  |  |  |  |  |  |

*[Add additional columns for all months of the year]*

8. Detailed Feasibility Study of the Project

*[This section should include a detailed feasibility study of the different components of the project]*

*[The technical feasibility should check every condition for the realization, the installation and maintenance of the system, so the technical feasibility study considers the technical features of the proposed system]*

*[This section should be divided into a number of sub-sections as shown in the table in Section 6]*

8.1 *[Insert Name of Measure 1]*

8.2 *[Insert Name of Measure 2]*

8.3 *[Insert Name of Measure 3]*

*[Add additional sub-sections for additional measures as needed]*

*[The below case studies should be completed according to the specific energy conservation measure (ECM). All recommended measures for the presented facility should be detailed and every sub-section should present the technical and financial basis for the analysis]*

*[All tables in this section are shown as examples of required summary tables in such technical feasibility studies and include minimum required information about the energy conservation measures (ECMs). Contractors or Consultants can add their own tables from excel calculations or softwares]*

8.4 Example 1: Lighting Energy Efficient Solution

*[This section related to the lighting part should include all details about replacement or installation of efficient lighting]*

*[The summary of the efficient lighting proposition should contain related savings and percentage of site saving; Economic parameters such as value of saved energy, Cost of modification, Simple payback period; Peak load reduction by the mentioned replacement; Lighting Intensity comparison between existing and to be installed lamps]*

*[A detailed description of lighting substitution or installation must be clearly presented in addition to the yearly energy savings in the table form below according to clearly made assumptions]*

*[The advantages from installing efficient lighting must be presented clearly especially the major opportunity for the facility to reduce its overall lighting load]*

*[The below table present the lighting project key financial indicators]*

*Detailed calculation of lighting installation*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Existing Lamp** | **Lamp replacement** | **Number of points** | **Existing Lamp Energy Consumption (kWh/year)** | **Lamp Replacement Consumption (kWh/year)** | **Energy Savings (kWh/year)** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

*[Add additional rows for additional types of lamps as needed]*

8.4 Example 2: Boiler Energy Efficient Solution

*[In the same direction of the lighting energy savings and proposal’s presentation, all types of energy efficient equipments and solutions should be presented and justified to pass under the requirements of green loans through NEEREA]*

*[Below are some examples for guiding on preparing the required energy data by equipment]*

*[Description of the existing and the proposed boilers is to be specified and detailed. Energy savings calculation from the exhaust boilers should be provided per month and the related cost also calculated]*

*[The following table should be as clear as possible to summarize the current situation of the site]*

*Boiler’s measurements*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***ID*** | ***Description*** | ***Pressure***  ***(Bars)*** | ***O2***  ***(%)*** | ***CO***  ***(ppm)*** | ***CO2***  ***(%)*** | ***Stack***  ***Temperature***  ***(°C)*** | ***Efficiency***  ***(%)*** | ***Excess***  ***Air (%)*** |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

*[The boiler’s operating efficiency as well as the oxygen (O2), carbon monoxide (CO) and carbon dioxide (CO2) levels represent critical factors for determining the boiler’s optimal operation. They should be indicated as presented in the previous table]*

*[The following table should be as a clear summary of the proposed ECM]*

*Boiler’s energy efficient measures*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description of the Boilers*** |  |  | ***TOTAL*** |
| ***Capacity of the new HOW boilers, MW (thermal)*** |  |  |  |
| ***Annual electricity consumption, kWh*** |  |  |  |
| ***Energy Savings, kWh/year*** |  |  |  |
| ***Energy saving ratio in comparison to base line (%)*** |  |  |  |
| ***Investment Cost, $*** |  |  |  |
| ***Simple Payback Period (years)*** |  |  |  |

8.5 Example 3: Compressor Energy Efficient Solution

*[For example, a company would like to replace pistons low efficiency compressors with new modern screw ones that will lead to electricity consumption saving up to 50%]*

*[Energy efficiency measures required are presented in the table below]*

*Compressor’s energy efficient measures*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description of the Compressors*** |  |  | ***TOTAL*** |
| ***Installed capacity of compressors, kW*** |  |  |  |
| ***Operational time, hrs/year*** |  |  |  |
| ***Electricity consumption, kWh/year*** |  |  |  |
| ***Electricity cost, $*** |  |  |  |
| ***Electricity savings, kWh*** |  |  |  |
| ***Energy savings, kWh/year*** |  |  |  |
| ***Investment Cost, $*** |  |  |  |
| ***Simple Payback Period (years)*** |  |  |  |

8.6 Example 4: Building Envelope Improvement

*[This section should include all energy savings actions that would happen every day of the year when improvements are made in the buildings such as sun control, windows film, roof insulation, green roofs, etc.]*

*[For the preparation of these energy conservation measures (ECMs) proposals, refer to LCEC Guidelines on Thermal Insulation for Buildings]*

*[Include photos and drawings if needed]*

*[Detailed information and technical discussion can be added in the appendices]*

8.7 Example 5: Solar Water Heaters System

*[In the same direction of the energy efficient equipments and proposal’s presentation, all types of renewable energy sources should be presented and justified to pass under the requirements of green loans through NEEREA]*

*[This section should include the solar thermal solution, monthly energy produced from the panels and monthly savings calculations in tables form. A detailed system description must be presented]*

*Solar Hot Water project key financial indicators*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***SWH*** | ***Description*** | ***Qty*** | ***Total Cost***  ***($)*** | ***Energy Savings (kWh/year)*** | ***Cost Savings ($)*** | ***Payback*** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

*[For the preparation of solar thermal system installation proposals, refer to LCEC Guidelines on Preparing Technical Proposals for Solar Thermal Systems Applications]*

8.8 Example 6: Solar Photovoltaic System

*[This section should include a detailed system description and a detailed technical study for the solar PV system installation proposals. References for the study of these systems should be LCEC Guidelines on Preparing Technical Proposals for Decentralized Solar Photovoltaic Systems (PV) Applications]*

8.9 Benefits of All Implemented Solutions

*[A brief summary will include energy savings, reduction of fuel consumption and EDL bills, reduction of greenhouse gas emissions of all recommended energy conservation measures (ECMs) related to the specific project]*

After application of all energy conservation measures, the energy consumption of the facility is summarized in the following table:

Summary of Benefits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Energy Savings** | **Reduction of Fuel Consumption Bills** | **Reduction of EDL bills** | **Reduction of CO2 emissions** | **Replacement Consumption (kWh/year)** |
|  |  |  |  |  |

8.10 Economic and Financial Analysis

*[In this section and based upon the technical feasibility study, preliminary cost estimation should be developed which includes all project expenditures and revenues]*

*[The most additional important points to be presented are the investment Cost; Ordinary and extraordinary maintenance costs; Consumption-related cost and Operational costs and Avoided costs and revenues]*

*[The financial sustainability of the proposal is based on the cash flow analysis that should be included in the financial analysis. Cash flow is the movement of cash into or out of a business; project or financial product (equals cash receipts minus cash payments). A detailed Net Cumulative Cash Flow “Diagram” based on the net cumulative savings through system’s life in order to give a complete view of the system’s financial benefits to the client is mandatory. The analysis of the cash flow must be done according to loan request’s period and interest rate depending on the client application and the commercial bank involved]*

*[In order to synthesize the analysis three indicators should be calculated and presented: Net Present Value (NPV), Payback period and Internal Rate of Return (IRR)]*

*[The net cumulative savings will be the essential data for concluding on the profitability and the return on investment. The following table should be used in such analysis and more detailed table can be provided according to the contractor or consultant detailed analysis:*

*Net Cumulative Savings*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Cash Out-Flows** | **Cash In-Flows** | **Total Cash Flow** | **Total Cumulative Cash Flow** |
| Year 1 |  |  |  |  |
| Year 2 |  |  |  |  |
| **Net Present Value (NPV)** | |  | **IRR** |  |

*[Add additional rows for additional years as needed]*

*[In addition, life cycle cost analysis of every energy conservation measure should be provided in this section showing the total cost of ownership for all the types of energy efficient actions including energy cost, replacement cost and maintenance cost over the lifetime of each system]*

*[The below case study added should be completed according to the specific energy conservation measure (ECM)]*

*[The table in this section is shown as example and includes minimum required information about the financial advantage of an energy conservation measure (ECM). Contractors or Consultants can add their own tables from excel calculations or softwares]*

*[An example is shown here below. For each type of lamp, a corresponding table should be filled as the following:*

*LCC for lighting replacement*

|  |  |  |
| --- | --- | --- |
| ***Lamp Type*** |  |  |
| ***Wattage (W)*** |  |  |
| ***Number of Lamps*** |  |  |
| ***Lifetime (hrs)*** |  |  |
| ***Illumination, lux*** |  |  |
| ***Total lamps installed capacity*** |  |  |
| ***Operational time (hrs/year)*** |  |  |
| ***Total Energy Savings (kWh/year)*** |  |  |
| ***Investment Cost*** |  |  |
| ***Simple Payback (years)*** |  |  |

*[Furthermore, cost of modification should be very clear for every item to be replaced in a table format presenting types, quantities, unit cost and total cost]*

8.11 Environmental Sustainability Analysis

*[The social and environmental sustainability analysis in this section should consider the environmental costs and benefits of the proposal (the so called negative and positive externalities)]*

*[For every ECM, the points to be included are the avoided green house gas emissions (CO2, SO2, and NO2); Carbon emission; other produced/avoided impacts (noise…); etc…]*

*Environmental data for the all ECMs*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ref. No.** | ***ECM*** | ***CO2 reduction***  ***(kg/year)*** | ***SO2 reduction***  ***(kg/year)*** | ***NO2 reduction***  ***(kg/year)*** | ***Other impacts*** |
| **1** |  |  |  |  |  |
| **2** |  |  |  |  |  |
| **Total** | |  |  |  |  |

9. Catalogs and Data Sheets

*[This section should include all detailed catalogs and data sheets for the different components of the project]*

*[The catalog and data sheets should be exactly as detailed in the invoice/quotations presented as part of this proposal]*

*[The different products chosen for the project should be highlighted with a marker]*

9.1 *[Insert Name of Measure 1]*

9.2 *[Insert Name of Measure 2]*

9.3 *[Insert Name of Measure 3]*

*[Add additional sub-sections for additional measures as needed]*

10. Invoices and Quotations

*[This section should include copies of all invoices or quotations chosen by the client]*

10.1 *[Insert Name of Measure 1]*

10.2 *[Insert Name of Measure 2]*

10.3 *[Insert Name of Measure 3]*

*[Add additional sub-sections for additional measures as needed]*

**ANNEX**

1. **Energy Conversion Factors for Greenhouse Gas Emissions**

*Energy Conversion Factors*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Fuel Type** | **Net Calorific Value (TJ/Gg)** | **Effective CO2 emission factor (Kg/TJ)** | **Units** | **kgCO2 per unit** |
| **Grid electricity** | - | - | kWh | 0.65 |
| **Gas/Diesel Oil** | 43.3 | 74 800 | Tonnes | 3238.84 |
| **Liquefied Petroleum Gases (LPG)** | 52.2 | 65 600 | Tonnes | 3424.32 |
| **Natural Gas** | 50.4 | 58 300 | Tonnes | 2938.32 |
| **Residual Fuel Oil** | 41.7 | 78 800 | Tonnes | 3285.96 |
| **Petroleum Coke** | 41.9 | 115 000 | Tonnes | 4818.5 |
| **Wood Pellets** | 31 | 132 000 | Tonnes | 4092 |

***\*Source: IPCC Guidelines for National Greenhouse Gas Inventories.***