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“Steps and Programme Components For a Sustainable Large Scale Dissemination of Renewable Energy (RE) Systems to End Users”

Mongi BIDA

First Economic Affairs Officer

UN-ESCWA Sustainable Development and Productivity Division - Energy Section



Steps and Programme Components For a Sustainable Large Scale Dissemination of Renewable Energy (RE) Systems to End Users



OUTLINE

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2. Assessment of E end uses in the targeted population and selection of the end use to be met by a RE source
3. Assessment of existing conditions and market situation of available / potential, conventional energy source(s) for targeted end use
4. Assessment of potential market for RE alternative(s)
5. Identification of existing barriers to the development of a large scale dissemination programme for the retained RE alternative(s)
6. Definition of short, mid and long term objectives (*Action Plan*)
7. Design and implementation of a sustainable organizational framework
8. Design and implementation of a sustainable financing mechanism
9. Design and implementation of an institutional and policy frame-work
10. Design & implementation of a sustainable quality enforcement /control scheme
11. Design and implementation of a continuous monitoring and evaluation scheme
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1. Introduction



- ❑ A **large scale** dissemination **programme** of RE systems, *targeting end users*, is designed to **allow a change of magnitude** in the implementation of such systems **within a targeted population** (example: Individual SWH systems, Individual Photovoltaic systems, etc.)
- ❑ The **programme** is intended to **induce a market shift** to the **selected technologies**, and to **build up a momentum** that allows the **takeoff of that particular product** sector.
- ❑ A careful **systematic approach** is needed for the **design of such a programme**, and a thorough **examination of all aspects pertaining to its implementation** is required to avoid any setbacks in the expected achievements and any reverse reactions.

The following is a review of the essential steps and components required to set up a successful and sustainable program:

2. Assessment of the energy end uses in the targeted population and selection of the end use to be met by a RE source



- ❑ Appraisal of the **importance** of the different end uses and their **characteristics** in the targeted population, including their **impacts** on the **quality of life** (**basic needs, hygiene, health, comfort, etc.**), and their stands in the **production** and **services** activities,
- ❑ Assessment of the **importance of the energy costs** associated with the different end uses (cost to **individual end users** and cost to the **collectivity**)
- ❑ **Selection of the End Use** to be targeted based on:
 - ✓ **its importance** with respect to the considered population,
 - ✓ the **degree of maturity of the RE** technology that can potentially replace (totally or partially) the existing conventional energy systems,
 - ✓ the **ease** of the RE systems implementation / deployment,
 - ✓ and a **preliminary economical evaluation** of the appropriate RE technology(ies) alternative(s)

3. Assessment of existing conditions and market situation of available or potential, conventional energy source(s) for targeted end use



- ❑ Availability of existing conventional energy source(s):
 - existing conventional energy source(s) for the targeted end use
 - current programmes for its dissemination throughout the territory
- ❑ Distribution apparatus and accessibility to targeted population: Current, and future, conventional energy distribution networks/circuits amongst targeted population
- ❑ Energy Costs to end users and to collectivity: current conventional energy costs to end users and to collectivity, and estimate of their eventual evolution
- ❑ Existing direct and indirect subsidies: existing direct and hidden/indirect subsidies to conventional energy source(s) for the targeted end use
- ❑ Environmental impacts of available conventional energy source(s): GHG emissions and pollutants, related to the targeted end use.

4. Assessment of potential market for RE alternative(s)



- ❑ Identification of **appropriate technology(ies)**:
 - ✓ review of **existing RE technologies** for the particular end use,
 - ✓ identification of **most appropriate** technology(ies) for the targeted population
- ❑ Existing, or potential, **local suppliers / market**:
 - ✓ assessment of local market for the identified RE technology(ies): **local suppliers, installers and technical expertise**.
 - ✓ potential **evolution of existing market** or need to **set up of new market**
- ❑ **Technically feasible** potential:
 - ✓ number of systems that can be disseminated within targeted population,
 - ✓ potential energy savings,
 - ✓ associated avoided GHG emissions

5. Identification of existing barriers to the development of a large scale dissemination program for the retained RE alternative(s)



- ❑ Identify **existing barriers** is a critical step in the set up of the dissemination programme: Need to perform a proper **diagnosis of the prevailing situation** & examine **the existing/potential obstacles** to the development of the programme

- ❑ Identify the **different actions required to overcome the barriers**:
 - ✓ **legal framework** and **policies** to be adopted,
 - ✓ required **capacity building** and **support** for **market actors**,
 - ✓ **financial schemes** to be developed,
 - ✓ **awareness campaigns** to be launched,
 - ✓ etc.

5. Identification of existing barriers to the development of a large scale dissemination program for the retained RE alternative(s)



ISSUES THAT NEED TO BE EXAMINED FOR POSSIBLE BARRIERS :

- ☐ Available **conventional energy** to meet selected end use: **Access** to conventional energy / existing **subsidies** (direct and indirect)
- ☐ Present / projected **RE system costs** to end users:
 - ✓ Initial investment costs,
 - ✓ estimate of life cycle cost / payback periods
- ☐ **Legal** framework & **existing policies** pertaining to the selected RE system:
 - ✓ adequacy of existing legal framework and policies,
 - ✓ level of existing fiscal advantages / customs duties privileges, etc.
- ☐ Present **level of awareness** with respect to RE in general, and the retained system in particular: amongst
 - ✓ policy makers,
 - ✓ professionals working in related fields
 - ✓ targeted population

5. Identification of existing barriers to the development of a large scale dissemination program for the retained RE alternative(s)



ISSUES THAT NEED TO BE EXAMINED FOR POSSIBLE BARRIERS (Continued):

- ❑ **Standards and technical specification** references with respect to the selected RE system: Gaps to be addressed; absence of / inadequate enforced technical specifications, standards, etc.
- ❑ **Existing network of local suppliers & installers**, for selected RE system:
Gaps to be addressed:
 - ✓ lack of local systems suppliers and installers
 - ✓ lack of professional qualification of existing supply businesses and services providers, etc.
- ❑ Available **financial schemes** and **packages** for consumer's goods in general, and RE systems in particular:
 - ✓ Access to financing resources by the targeted population,
 - ✓ available financing scheme(s) that can be used or adapted for dissemination of retained RE system(s),
 - ✓ importance of available credit lines, etc.

6. Definition of short, mid and long term objectives (*Action Plan*)



- ❑ Develop a **comprehensive & realistic** “Action Plan” setting the basis for the dissemination program **short, mid and long term** goals / objectives, based on findings developed in the previous steps:
 - ✓ Potential market for the retained RE system/technology
 - ✓ various barriers that need to be overcome through a systematic tackling of the different gaps,
- ❑ Goals should be **clearly defined** in terms of:
 - ✓ Program **duration**,
 - ✓ total **number of systems** to be disseminated over program duration,
 - ✓ Progressive **annual rates** over the concerned period of time

6. Definition of short, mid and long term objectives (*Action Plan*)



ACTION PLAN (Continued):

- ❑ It should clearly identify **all actions & measures required** for the success of the programme (based on defined goals and identified barriers):
 - ✓ **Number** of trained/accredited **suppliers, installers & technical experts**
 - ✓ **Other support material & human resources** to be mobilized / set up, over the program duration to meet the defined goals: **Media campaign, awareness raising** activities, **capacity-building** requirements, etc.
 - ✓ **Total** required **funds** to be raised.
 - ✓ Outline of the **organizational framework**, and **major stakeholders** to be participating in the program
 - ✓ Outline of needed **institutional and policy framework**, and **required amendment/updates** to existing frameworks, if any
 - ✓ Outline of the **financing mechanism** proposed for the dissemination program
 - ✓ Outline of the **quality control, monitoring** and **evaluation approach** proposed for the dissemination programme

7. Design and implementation of a sustainable organizational framework



- ❑ A sustainable dissemination program requires a self-sustained and durable organizational framework
- ❑ The organizational framework should mobilize all relevant stakeholders, and potential contributors, including:
 - ✓ A public institution to **lead the Program** (possibly the national institution in charge of RE in the country): through a **dedicated Project Management Unit**, or outsourcing.
 - ✓ Private **operators** : Suppliers, installers, technical experts, etc., preferably through their representative bodies if any,
 - ✓ The **Ministry of finances** (or other relevant authority) to allocate any applicable subsidy; custom duty wavers, etc. & specify/endorse the eligibility conditions and the procedures for their applications
 - ✓ One or more **international donor(s)** to contribute to the financing of the program
 - ✓ One or more **local bank(s)** to manage the credit line dedicated to the dissemination program
 - ✓ The **Central bank**, where applicable

7. Design and implementation of a sustainable organizational framework



ORGANIZATIONAL FRAMEWORK (Continued):

- ✓ A public or private institution to insure the **administration and recovery of the individual loans** (preferably an institution that already has an operating billing system amongst the targeted population: e.g. a utility company)
- ❑ The organizational framework should **define the arrangements** that are required in terms of **institutional and policy/legal** dispositions in order to accommodate the proposed program and identify if any amendments are necessary to existing frameworks
- ❑ The organizational framework should develop the **outline for the required financing** mechanism
- ❑ The organizational framework should **clearly define the role of each actor** and **precisely specify** the different **procedural dispositions** involving the relationship, assignments and flow/exchange of relevant information and documents between the various actors

8. Design and implementation of a sustainable financing mechanism



- ❑ A sustainable dissemination program requires a **self-sustained** and **durable financing** mechanism
- ❑ A successful financing mechanism is usually based on the following items:
 - A **contribution** from the **state** in the form of:
 - ✓ a **tax waiver**, to lower cost of product,
 - ✓ a **subsidy**, to cover part of the end user down payment
 - A **dedicated line of credit** to provide loans to end users at reasonably low interest rates, to finance the acquisition of the product
 - A **contribution** from an **international donor** to cover part of the final cost to end user, or contribute to lowering their loan's interest rates
 - **Clear, simple and easy-to-implement procedures** to cover attribution and recovery of end users loans, as well as payment of suppliers
- ❑ A sustainable **financing mechanism should insure a win/win situation** for all stakeholders. In particular it should allow the following:

8. Design and implementation of a sustainable financing mechanism



FINANCING MECHANISM (Continued):

- ✓ A **final** equipment **cost** for the end user that has an **attractive / reasonable pay-back** period
- ✓ A **payment modality**, for end users, that allows a down payment, and subsequent periodic payment installments, **that can easily be arranged by all end users** of the targeted population over a reasonable time span (ideally, no more than 5 years, with payment installments equivalent to conventional energy expenses associated with the targeted end use)
- ✓ A **subsidy level** for the community / state that **has an attractive / reasonable pay-back period** or **cost/benefit ratio**
- ✓ A **budget assignment**, and **disbursing modality**, for the **international donor** contribution, if any, that **meets the conditions** specified by the relevant donor's rules
- ✓ A **simple**, and **reasonably fast**, procedure to **pay suppliers** once equipments are supplied, installed and accepted through the program

8. Design and implementation of a sustainable financing mechanism



FINANCING MECHANISM (Continued):

- ✓ A **low transaction cost** at the level of the bank managing the loans intended for the end users
Ideally, by **handing over the administration/recovery of the individual loans** to an **institution that already has an operating billing system** amongst the targeted population: e.g. a utility company.
- ✓ This institution can:
 - deal with the bank based on **batches of end users and suppliers**,
 - provide a **guarantee of reimbursement** for the end users loans.This, in turn,
 - Contributes to **lowering the transaction costs** at the bank level.
 - Allows **end-users** with no bank affiliation to **access the program**

8. Design and implementation of a sustainable financing mechanism



FINANCING MECHANISM (Continued):

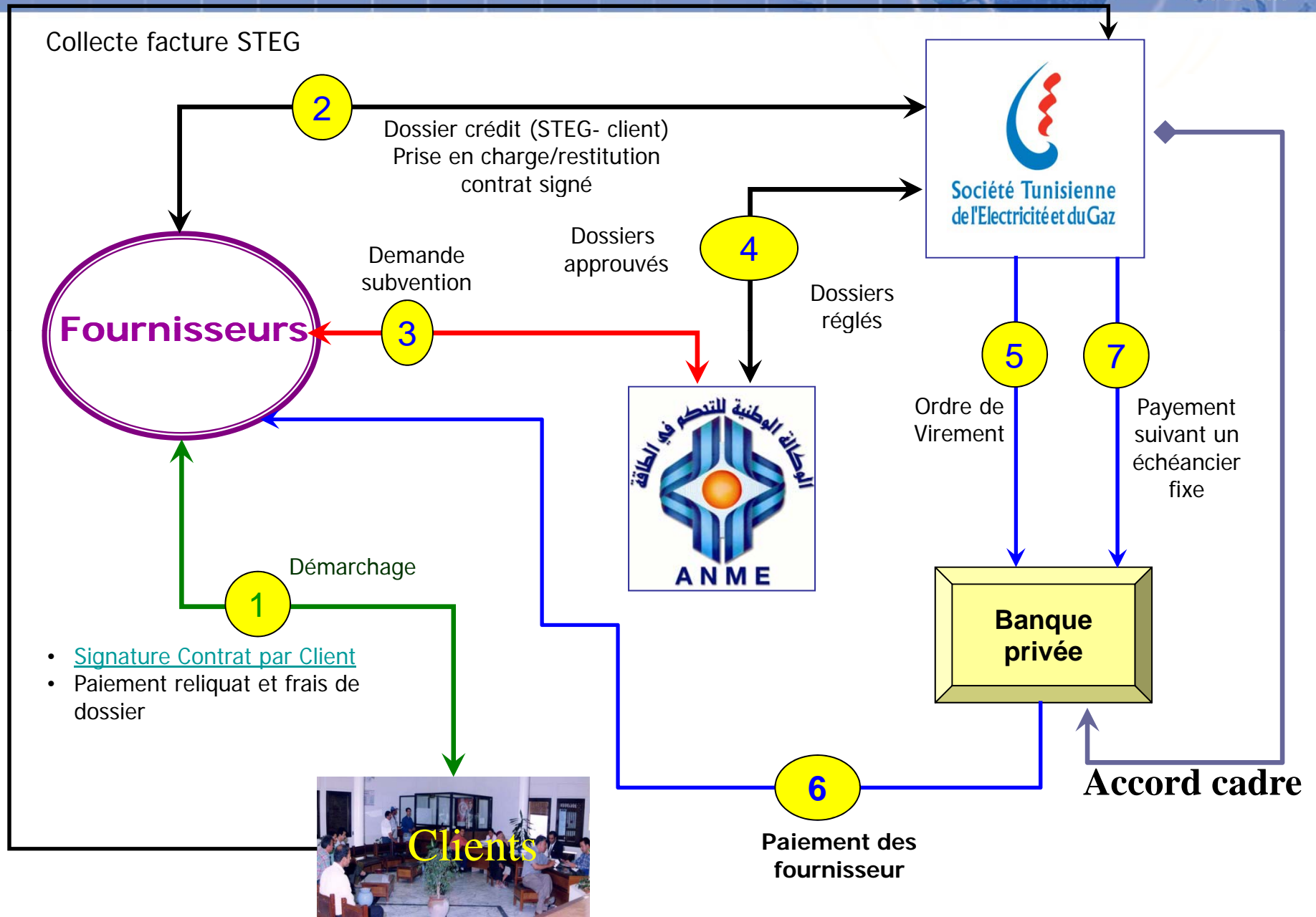
- ✓ A reimbursement of the transaction costs incurred by the institution insuring the administration of loans. These should be part of the down payment made by the end user & should be reasonably low, since they only involve adding an item to its existing billing system
- ❑ The programme should be designed to **allow the financing scheme** to benefit from **available funds provided by international donating institutions**
- ❑ The dissemination program should be designed to **allow the financing scheme** to benefit from **applicable carbon market mechanisms** (CDM, NAMA, etc.)
- ❑ In order to insure sustainability, the financing mechanism should be designed & sized to account for setting up a **revolving fund**, based on the **loans reimbursement rates** and possible **revenues from carbon market**, that allows its continuation beyond the program's initiation period

9. Design and implementation of an institutional and policy framework



- ☐ The existing institutional and policy framework, if any, should be:
 - ✓ adapted to provide a **strong support** for the dissemination program and **send the right signals** to the different stakeholders
 - ✓ examined in the light of the proposed dissemination program objectives, financing scheme and organizational framework, and **propositions** should be made to **amend/update** existing framework **to meet the program's goals**
- ☐ The policy framework should provide the **legal/official basis** for:
 - the proposed organizational framework and retained financing mechanisms
 - the proposed subsidies / tax waivers
- ☐ The institutional framework should accommodate the proposed organizational framework, and provide the official basis for all the roles played by the various stakeholders and the various interactions between them
- ☐ The institutional framework should provide the basis for setting up a dedicated Project Management Unit to run the program, or allow outsourcing of this task to a qualified private entity

Le mécanisme de gestion du PROSOL

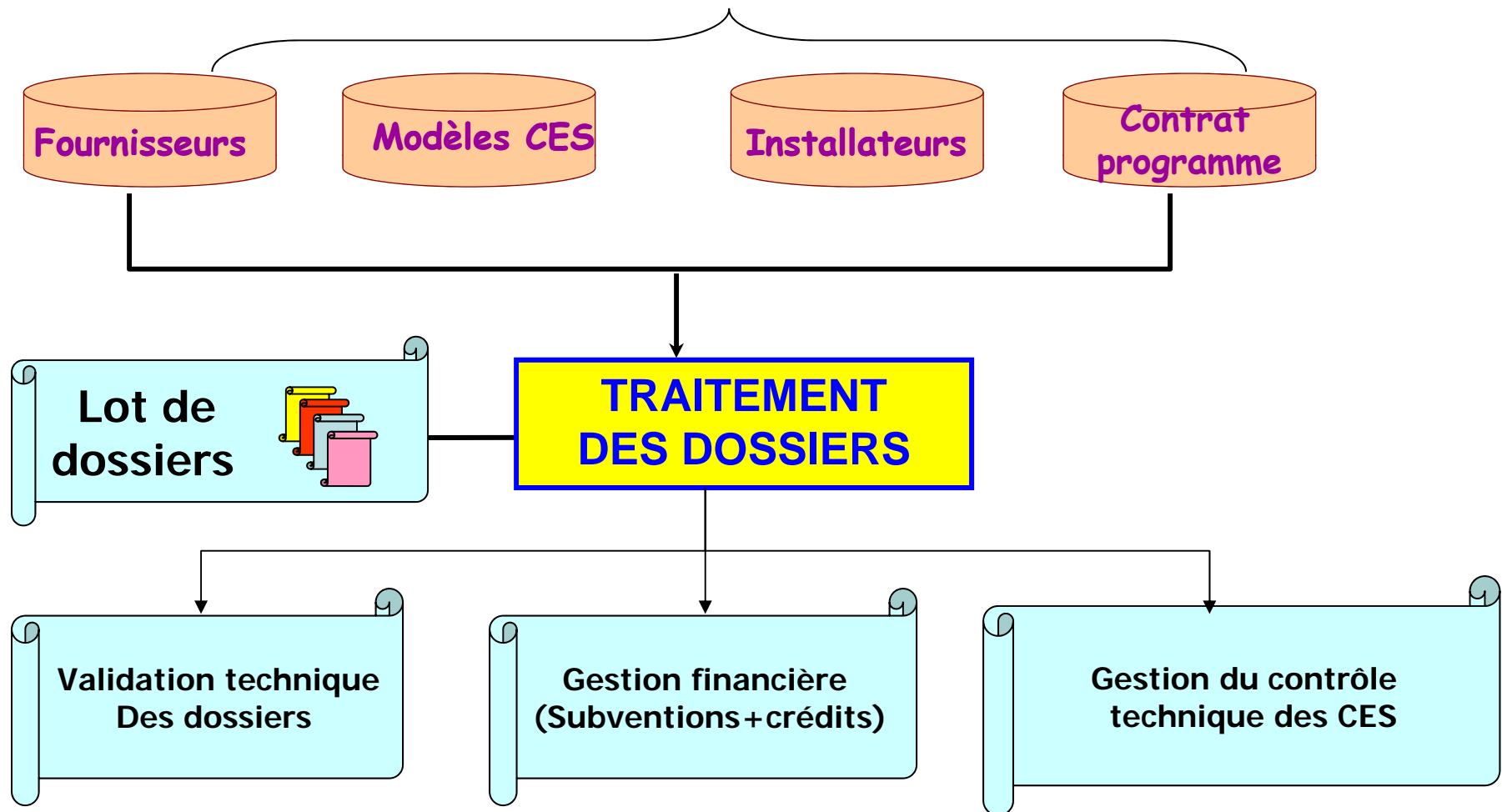


APPLICATION INFORMATIQUE DE GESTION DU PROSOL II DANS LE RESIDENTIEL



Le schéma de principe

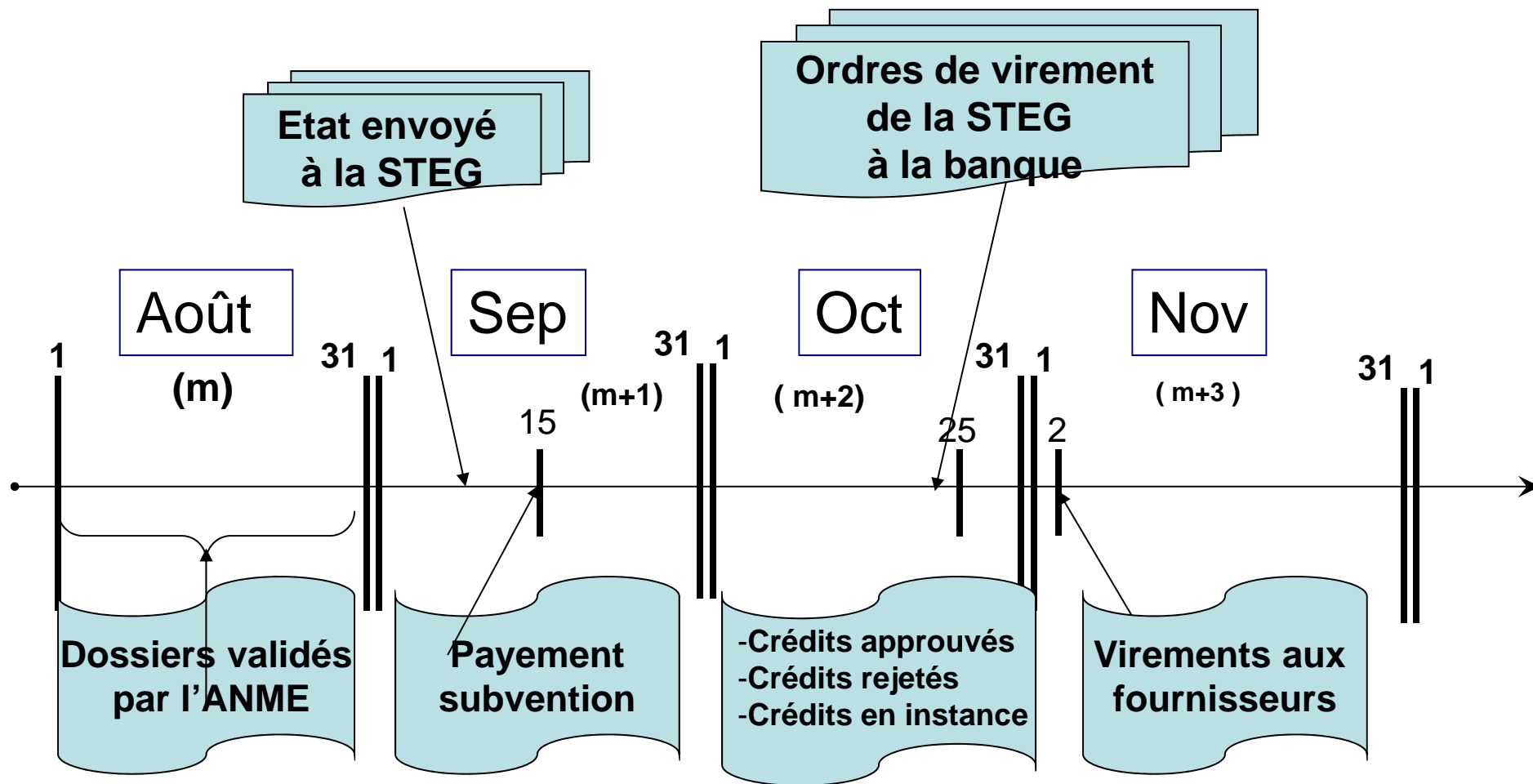
Bases de données



Gestion financière des subventions et des crédits



□ Les délais contractuels (Exemple)



10.Design and implementation of a sustainable quality enforcement and control scheme



- ❑ Quality control is a detrimental key factor in the success of any large-scale dissemination program that seeks sustainability.
- ❑ It is more crucial for RE equipments, where some seemingly minor issues can lead to very negative results that may put the program in jeopardy.
Example: Allowing systems with inappropriate material or coating in the tank of an individual solar water heater will result in a quick deterioration of the latter and therefore a serious counter performance, leading to a very bad reputation for the equipment and the program.
- ❑ The comprehensive quality control scheme should accomplish the following goals:
 - ✓ Insure a certain quality level for the equipments and systems installations
 - ✓ Insure a minimum level of energy yield and system life span
 - ✓ Provide a framework allowing consumer reassurance and market development

10.Design and implementation of a sustainable quality enforcement and control scheme



QUALITY CONTROL SCHEME(Continued):

- ❑ The comprehensive quality control scheme should, at least, cover the following aspects:
 - ✓ Qualification of products (RE equipment(s))
 - ✓ qualification of suppliers
 - ✓ qualification of installers
 - ✓ qualification of technical experts, controllers and other key operators in the program
- ❑ The comprehensive quality control scheme should be based on a pre and post installation apparatus:
 - ✓ A pre-installation qualification system requiring that:
 - only pre-qualified equipments can be sold through the dissemination program
 - only pre-qualified operators (suppliers, installers, technical experts, etc.) can participate in the dissemination program
 - ✓ A post-installation quality control system based on systematic inspection and monitoring of installations where operators are sanctioned if the equipments or services provided do not meet requirements

10.Design and implementation of a sustainable quality enforcement and control scheme



QUALITY CONTROL SCHEME(Continued):

- ❑ The Pre-qualification scheme can be based on a set of requirements contained in an “**Eligibility Bill of Conditions**” specifically developed for the RE equipments, as well as each of the operators (suppliers, installers, technical experts, etc.)
- ❑ Adhesion to the program of eligible products, or operators, would go through a formal process insuring that conditions stated in these documents are fulfilled for the pre-qualified equipments or operators.
- ❑ Conditions can include:
 - For **products**:
 - ✓ Standards and technical specifications that need to be met by the equipment,
 - ✓ guaranteed energy yields,
 - ✓ warranties to be provided,
 - ✓ spare parts to be made available by suppliers,
 - ✓ etc.

10.Design and implementation of a sustainable quality enforcement and control scheme



QUALITY CONTROL SCHEME(Continued):

➤ For **operators**:

- ✓ Minimum number of personnel dedicated to the program,
- ✓ mandatory qualifications and training(s) to be completed by involved personnel,
- ✓ technical specifications for installation design and procedures,
- ✓ working tools and equipments,
- ✓ etc.

❑ The pre-qualification scheme should clearly identify the following:

- ✓ The institution that is in charge of the eligibility process
- ✓ The relevant products and operators subject to pre-qualifications
- ✓ The detailed procedures, required steps and conditions for each eligibility process

10.Design and implementation of a sustainable quality enforcement and control scheme



QUALITY CONTROL SCHEME(Continued):

- ❑ The list of pre-qualified products and operators should be easily accessible to targeted population
- ❑ The quality enforcement scheme should provide clear indications regarding all technical matters:
 - ✓ technical specifications for products,
 - ✓ installation procedures and maintenance routines,
 - ✓ operators' qualifications, etc.
- ❑ All specifications and instructions should be included in official program documents and be an integral part of it.

11.Design and implementation of a continuous monitoring and evaluation scheme



- ❑ In order to insure sustainability for the program, it is essential that program implementation progress be closely monitored, to:
 - ✓ identify in a timely manner, any unforeseen obstacles or inadequacies
 - ✓ make necessary adjustments to correct the course of the program
- ❑ The monitoring and evaluation scheme should preferably be set up in a software application to keep track of the following:
 - ✓ Volume of installations achieved periodically compared to stated objectives
 - ✓ Geographic distribution of end-users that benefited from program
 - ✓ Estimated annual energy yields provided by installed systems and avoided GHG
 - ✓ problems encountered in the relationship, assignments and flow/exchange of relevant information, documents and work assignments between the various actors

11.Design and implementation of a continuous monitoring and evaluation scheme



MONITORING & EVALUATION SCHEME(Continued):

- ✓ number of unsatisfied end users and causes of unsatisfaction
- ✓ suppliers and installers performance in terms of number of installations achieved and quality of products and installations
- ✓ Delays encountered in supply and installation procedures (statistics per supplier and installer)
- ✓ Delays encountered in funds allocations and mobilization
- ✓ delays encountered in suppliers/installers payments
- ✓ delays encountered in end-users loans administration and recovery
- ✓ maintenance records and technical problems encountered (statistics per supplier and installer)
- ✓ All other problems encountered in the implementation of the program

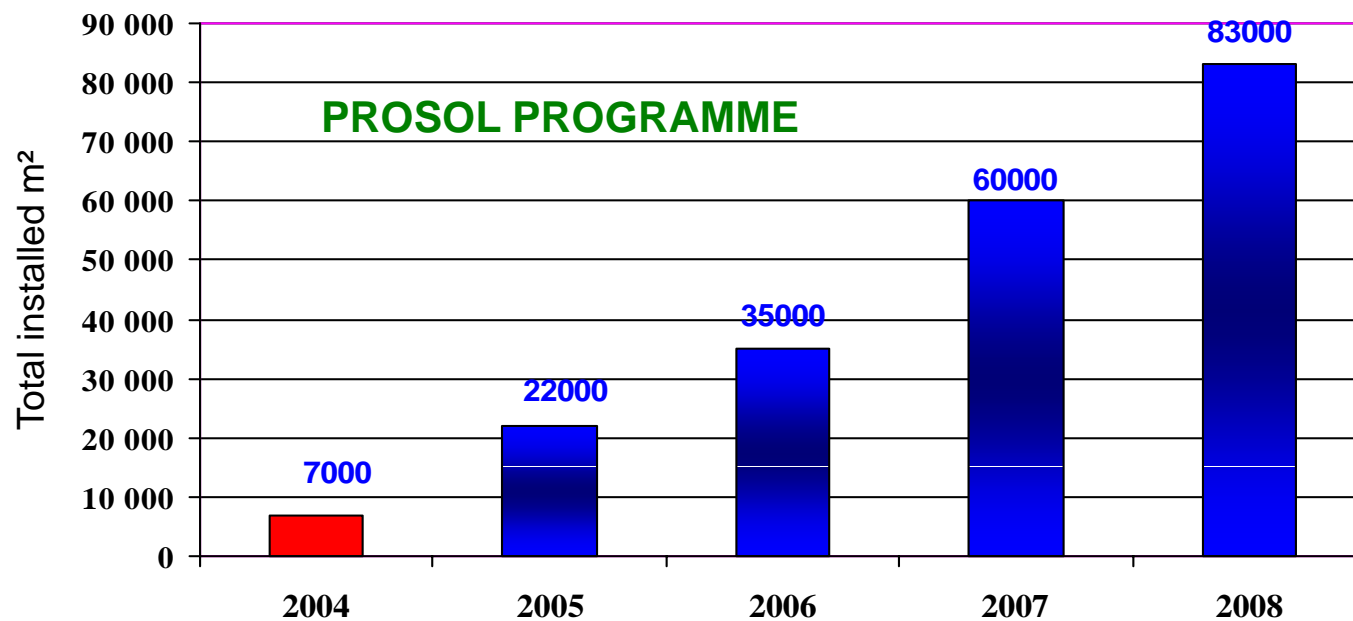
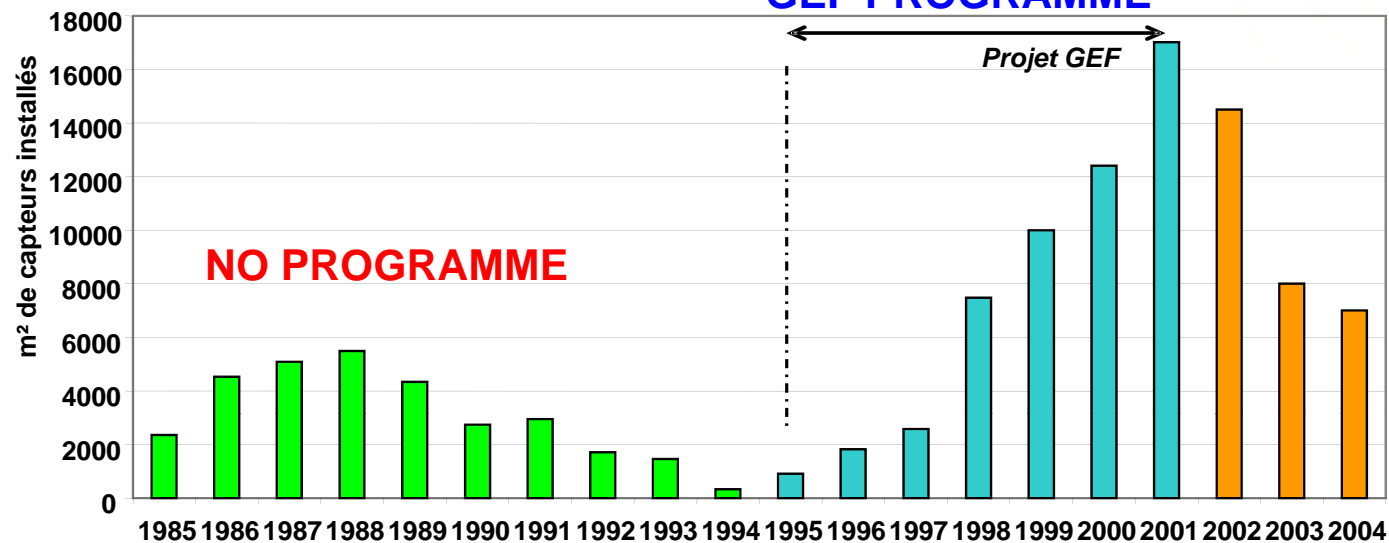
11.Design and implementation of a continuous monitoring and evaluation scheme



MONITORING & EVALUATION SCHEME(Continued):

- ❑ In order to insure sustainability for the program, it is essential that **program implementation progress** be closely **monitored**, to:
 - ✓ identify in a timely manner, any unforeseen obstacles or inadequacies
 - ✓ make necessary adjustments to correct the course of the program
- ❑ The monitoring and evaluation scheme **should include a periodic reporting** (Example: 4 quarterly reports + 1 annual report) summarizing program performance and drawing attention to any encountered problems that need to be addressed. The reports should be submitted to all stakeholders and discussed with them.
- ❑ The monitoring and evaluation scheme should also include an **emergency action mechanism**, in case of a serious incident affecting the dissemination program.

GEF PROGRAMME



12. Conclusions



- ❑ A large-scale dissemination programme of RE systems, targeting end users, requires a **comprehensive approach** in order to insure its sustainability.
- ❑ The program should make **the retained RE technology easily accessible to a very large portion of the targeted population** and should **insure their satisfaction** by guaranteeing a minimum performance, quality and life span for the products
- ❑ The program should **be designed** carefully, **based on self-sustained components**, to induce a market shift to the selected RE technologie(s), and to build up a momentum that allows the takeoff of that particular product sector.
- ❑ The **components** of the dissemination program should be **designed through a systematic approach**, and a thorough examination of all aspects pertaining to its implementation, in order to avoid any setbacks in the expected achievements and any reverse reactions.

12. Conclusions



CONCLUSION (Continued):

- ❑ The programme should **mobilize all potential stakeholders** within an **organizational framework** that engages them in a clearly defined set of formal relationships
- ❑ **All aspects** of the programme should be **clearly documented and monitored** in order to:
 - ✓ insure a clear understanding of the tasks and roles assigned to each actor,
 - ✓ to be able to identify any possible malfunctioning
- ❑ The retained procedures should be defined in a **precise manner**, but **should allow for a certain flexibility** in order to accommodate any corrective action

Thank you for your attention

**Mongi BIDA
bida@un.org**