

# **Lesson Learned and Best Practices in the Implementation of Solar PV Project in Rural Areas from Solar PV Dealer**

Round Table Discussion

Organized by

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# CHALLENGES AND OPPORTUNITIES FOR PV- SYSTEM DEVELOPMENT

- Indonesia has more than 20 million un-electrified households (48% of the total);
- Electricity supply is seriously lacking in some regions, particularly beyond Java and Bali.
- Government funds alone are not sufficient for the development and maintenance of rural electricity systems in a big way;
- Rural electrification using conventional energy is no longer favored and shall be avoided where possible. Instead, producing renewable energy based electricity must be put as a priority. (PP No. 4, Blueprint for Energy Development 2005 – 2025)
- National electricity tariffs have been increasing and will continue to rise in the future, spurred by significant increase of crude oil in the world market and government subsidy elimination.
- SHS /PV is relatively expensive for rural people., but this condition can be overcome by making available affordable credit systems enabling the rural people to purchase the system. There are also various sources of finance available that eventually can be utilized to develop financing schemes for PV system dissemination in rural area.
- Consumer locations are in many cases so spread out, resulting in relatively high sales costs, but this problem can partially be overcome by involving 'local entrepreneur.
- The PP No. 4 2005 replacing the now defunct 2002 Electricity Bill mandates Regional Government to use local and renewable energies in providing electricity to local population. Solar PV is the only renewable energy sourced electricity available in ALL regions, and therefore the immediate choice for providing quick solution to electrification in rural and remote areas.
- Solar cell prices are showing a decreasing trend over the last 2 decades and will continue to decrease in the future that will make Solar PV increasingly competitive to conventional energy based electricity. The current situation of 'silicon shortage' which make the solar module price increased significantly in the world market is believed to be a temporary phenomenon.



## A STAGNANT PV INDUSTRY

- Business was and is highly dependent on government projects (and budget), with marketing strategies geared towards strong lobbying, and bidding for the lowest price to beat the “competitors”, even though the government budget always sets the price much higher than the current market price.
- Direct (Retail) Sales Operations are costly due to geographical factors and only a handful Dealers having a long term business vision engaged in this process.
- There were over 50 vendors doing business in PV when the system was introduced in Indonesia, there are now less than 20 dealing seriously with PV, and only 2 are dealing with commercial retail market offering some sorts of after sales services



## SOME PROBLEMS CAUSING SLOW DEVELOPMENT OF COMMERCIAL PV-SHS BUSINESS

- Lack of clear and pragmatic government policy supporting PV utilization. Projects initiated and run by various (government) institutions to distribute PV-SHS were in many cases considered as a 'temporary' solution. Government distributes PV free of charge with no clear direction and planning on meeting the electricity need of the rural population, hence, no incentive for private sector to engage in PV business.
- Inadequate government's support to various PV programs initiated by international donors and agencies discourage these or international financial institutions to create new initiatives.
- Dedicated sales and distribution networks have not been adequately developed. Building it effectively requires a large capital
- Affordable financing options to support credit sales were not locally available and only since recently being offered by one bank (BRI) with very limited number of vendors participating in the scheme.

# The Lessons Learned

- The SHS users ( in rural areas) *need some time* to learn the use of the solar electricity properly, as most people did not realize the limit of the technology.
- System units ( SHS) deployed by the government were mostly of *small capacity* (50Wp). Though it meets the very basic need of electricity, e.g. lighting, in many cases they do not meet the users' need for electricity to catch up with some modernity.
- Even though the price of a typical entry level SHS is still relatively *expensive* to average potential users in rural regions, there is a clear trend in the increase of demand for bigger systems, ( 100 – 200Wp) provided suitable and affordable *consumers credit* scheme is available.
- Insufficient maintenance, especially on the battery system, leading to some sort of system troubles, therefore the availability of *service centers* in accessible locations, where users can turn to in case of system trouble, is absolutely required

# The Lessons Learned

- There was a serious *lack of financial services* for potential users in the rural areas. This has hampered the development of a commercially sustainable market for Solar PV. *Bank Rakyat Indonesia* (BRI) is currently (since 2004) the only financial institution offering limited consumer credit at commercial interest rate to potential users.
- PV systems were incorrectly perceived as only meeting the electricity need for rural and *isolated* area. This inaccurate perception makes the system unattractive for and found ignorance among people living in urban areas.
- Many of the country policy makers do not sufficiently and seriously consider PV as potential solution to reduce the country's dependence on fossil energy. In many cases PV is the considered as the last option, if other systems are not viable.
- PV systems deployment initiatives in the country were made by various government bodies at central as well as regional level. Unfortunately these efforts were not well coordinated as an implementation of a deliberate policy by the authorities at central government level

# The Lessons Learned

- The possible applications in other than SHS were not well understood.
- There were some confusions about the status of PV technology and the related availability of modules in the market. Crystalline modules were commonly perceived as better than thin-film based (amorphous) modules
- People living in *urban* area were beginning to show interest in using PV to meet some of their electricity need, triggered by frequent power black out experienced during the recent years as a result of deteriorating power supply condition in the country. Unfortunately, this phenomenon was not seen by ( and therefore did not get response from) the government, and therefore disappeared when the utility problems have seemingly “solved”
- The practice followed by government institutions distributing PV (under the rural electrification programs) with no compensation expected from the receivers, made it difficult to build up and maintain sustainable PV business in rural area. Above all, the process and procurement procedures are in most cases prone to corrupt practices.
- A recent study commissioned by the World Bank in 2003, indicated a very positive impact of using SHS on the rural socio-economic development. People were generally satisfied with the system’s performance, and they eager to expand their use if they can obtain some financial support ( consumer credit scheme)



# KNOWN MODELS OF FINANCING

- THE GOVERNMENT BUDGET FOR RURAL ELECTRIFICATION
- THE INTERNATIONAL AGENCIES SUPPORTS AND INITIATIVES
- THE BUSINESS COMMUNITY INITIATIVES

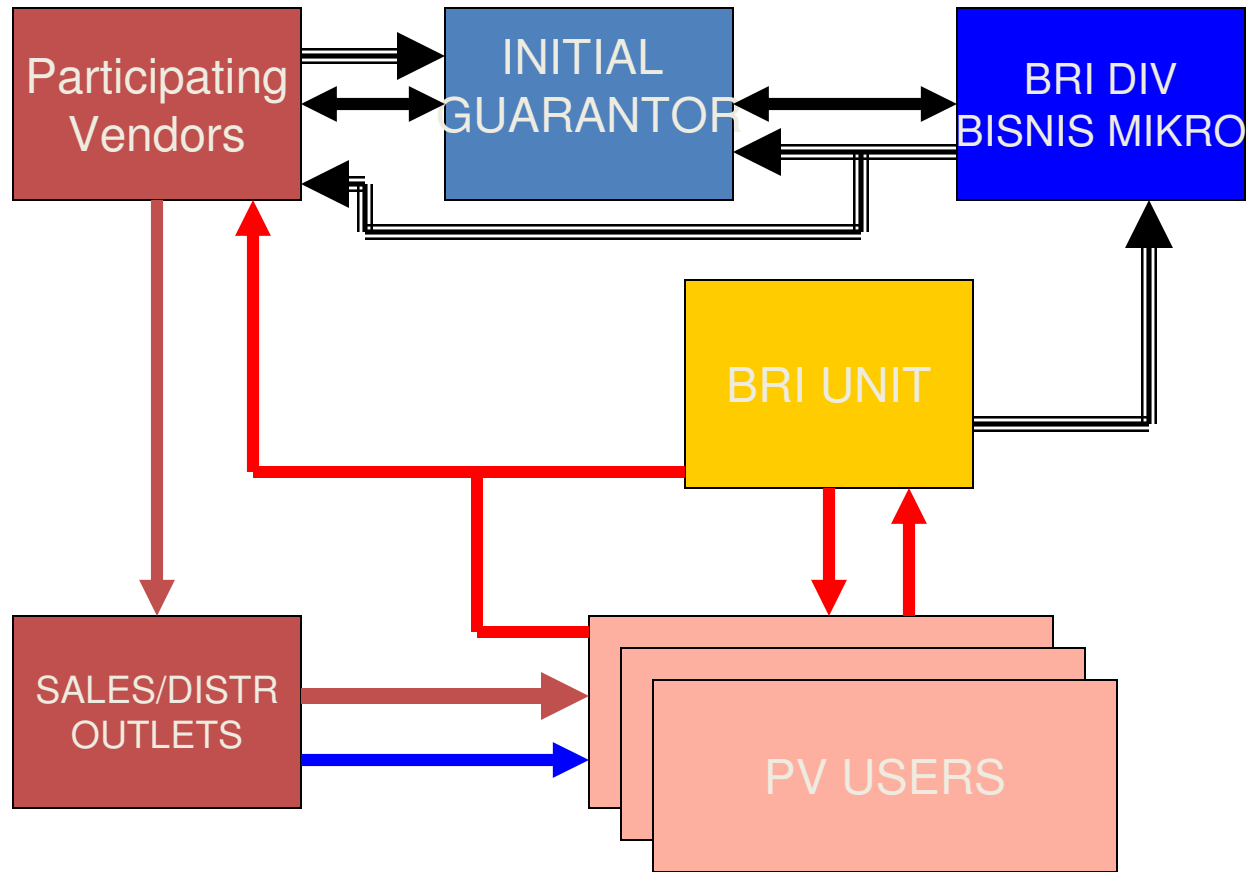


# GOVERNMENT (BUDGET) PROCUREMENT FUNDS

- Governments purchase the PV Systems from local (mostly non-dedicated PV company) 'dealer' by tender, in which the lowest bidder is the winner.
- Users are selected by the government -- they get it free of charge.
- System price is (usually) marked up with survey, installation and other various costs that makes it unnecessarily higher than the "reasonable" price normally offered by dedicated dealers.
- System quality varies widely depending on who is making the 'project specification' and the availability of after sales service are practically non-existence
- Number of Systems installed ( purchased) is highly dependent on the government budget on rural electrification ( PV is mostly low priority due to lack of awareness in the systems capabilities and other merits)
- System utilization distribution is in many cases so scattered or fragmented -- it doesn't give the required impacts on the development program.

# SHS MICRO CREDIT FOR RURAL AREA

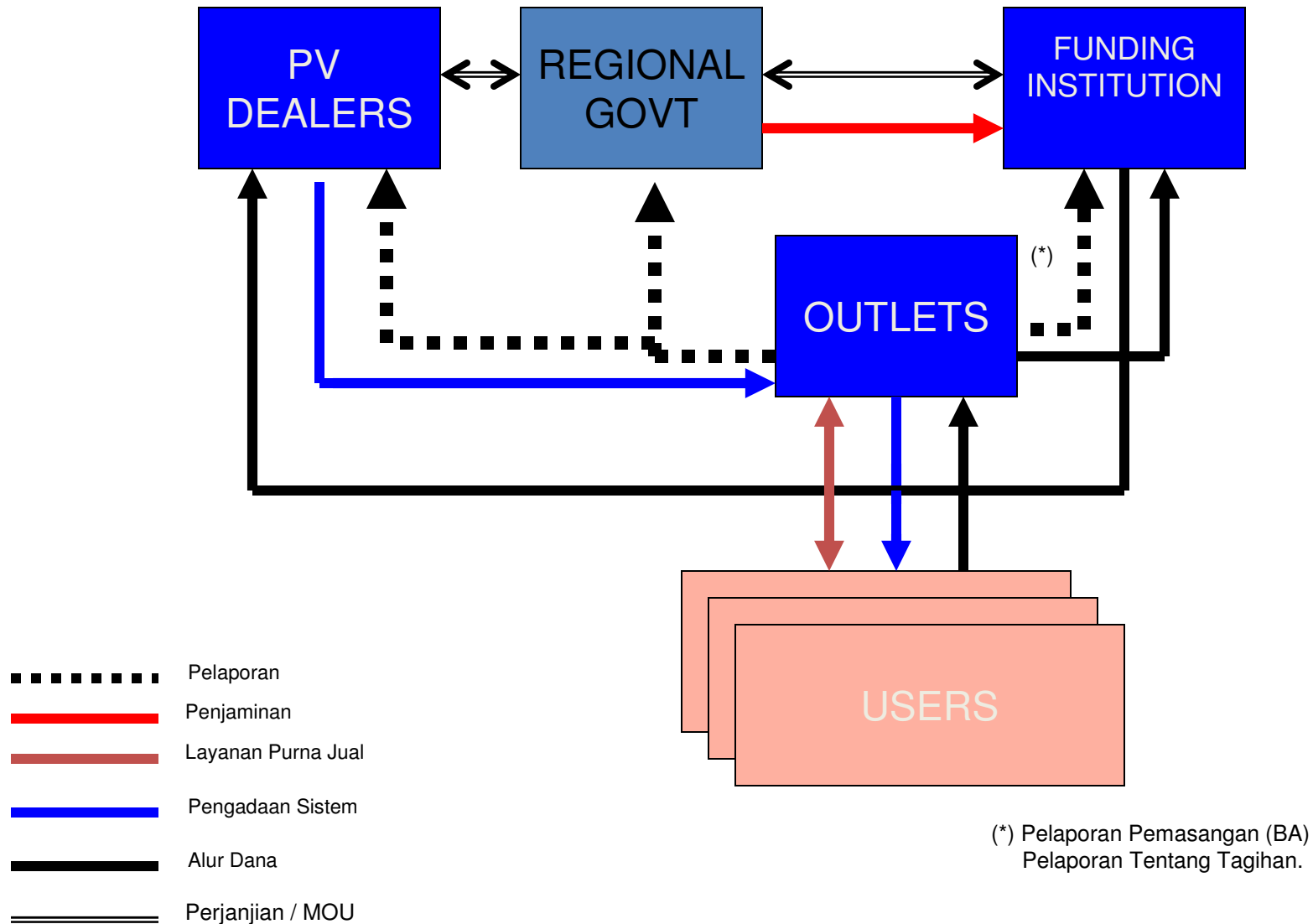
## THE "BRI'S KUPEDES" MODEL





# PROPOSED RURAL LOW-INTEREST CREDIT SCHEME

## Alternative II



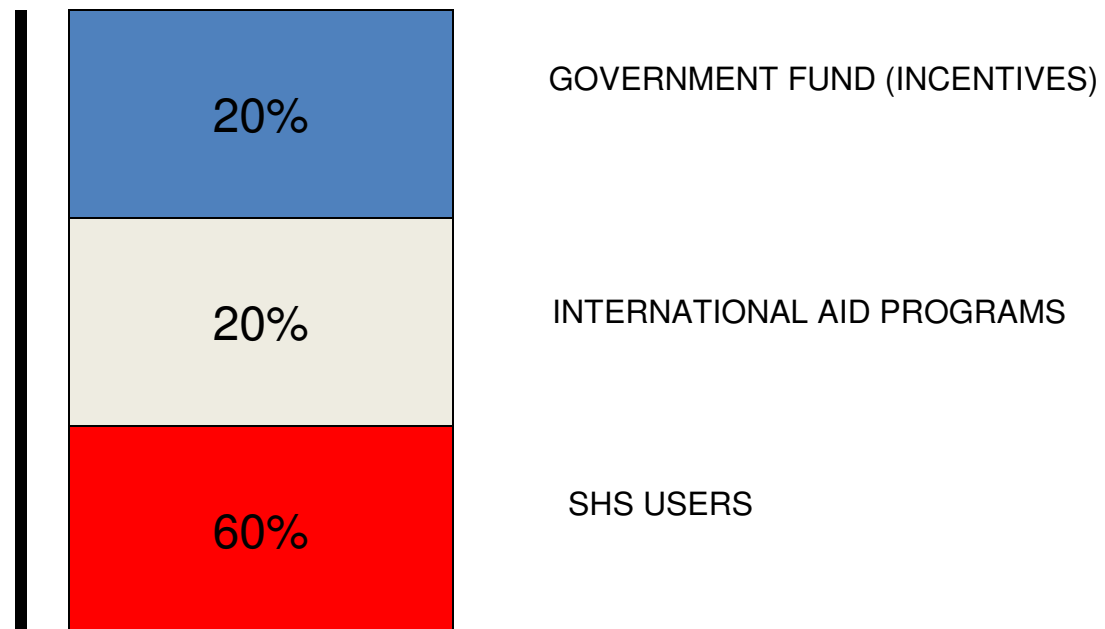


## “IDEAL” PRICING FOR SOLAR HOME SYSTEMS

BASED ON THE AVERAGE “ENERGY  
BUDGET” OF RURAL COMMUNITIES

### PV COMMERCIAL PRICE

USD 500 / 50Wp  
USD 800 / 100 Wp



“Ideal” Micro Credit Scheme: Tenor 3 Yrs (Max), Interest Rate 10%/year, Installment IDR 70,000 (USD7/month ( for 50Wp and IDR 115,000/USD 11/month for 100Wp SHS)  
Using the above price assumption

# What can be done

1. Set effective legal and regulatory frameworks to support the development of renewable energy use as a significant component of the national energy policy and goals.
2. Set a clear goal and it must be realistic and big enough in terms of volume to attract private sector to engage in the business
3. Set an attractive incentive system to induce people to use renewable energy
4. Establish a reasonable budget and financing scheme from various sources
5. Build up capacity among dealers, local institutions to provide adequate services
6. Invite international community and institutions to participate in the program
7. Establish credible control mechanism to monitor and evaluate the programs

# CONCLUDING REMARKS

- Establishing the right system for financing the dissemination of Solar PV systems in the rural regions is the foundation for success. The financing system must be applied to support the development of a healthy and commercially based distribution system. Financing system must be aimed at providing the rural people with facility that would enable them to purchase the PV systems within their known average “energy budget”.
- The financing facilities should also cover the ‘supply side’ of the PV business equation. It should provide dedicated vendors, system integrators and local component manufacturers with means to make their operations viable and worthwhile to sustain.
- The financing efforts should involve specially dedicated institutions which have built their reputation in providing consumer credits to rural communities and mainstream institutions if the PV systems are marketed and distributed to urban community.
- The dissemination of PV without requiring some sort of reasonable compensation from the users will not only spoil the commercialization process of the PV industry, it would also handicap the PV technology’s own reputation in providing alternative electricity to the rural communities.
- Successful installation of PV systems and administration of credits provided to consumers in rural area must be followed by the establishment of an effective after sales services system made available by a commercially based PV industry. This would not only warrant the consumer loan repayments, if applicable, but also would help keep the PV system reputation high among the users.
- The regional autonomous governments, under the new Energy Bill of 2007 must develop their serious commitment and concrete initiatives to create affordable financing facilities, in collaboration with domestic and international funding institutions, to make a great impact on rural electrification using renewable energies

# CONCLUDING REMARKS

- To sustain the effective use of PV for rural electrification, the system must be distributed based on commercial principle and mechanism. A dedicated aid program like the GEF/World Bank Program for Solar Home Systems would greatly benefit the country in further developing a healthy and sustainable PV industry. Such program must be implemented long enough to get the real impact on the development of the industry and the utilization of PV as an alternative to the conventional energy.
- Financial institution specially dedicated to financing renewable energy development such as “Green Funds” are needed to give a greater impact to the “supply sides”, by financing industrial activities in the country that would push the price of the PV Systems down and affordable to greater number of people.
- To induce the private sector, including the financial institutions entering into the renewable energy business, particularly the Solar PV, in a big way, the government should consider seriously to allow the demand sector to grow more considerably by introducing ‘grid connected’ solar PV systems in urban areas