

## THE BOTTOM LINE

Attractive opportunities to invest in energy efficiency are often passed up for lack of commercial financing. Donors and governments can solve this problem by setting up dedicated credit lines that allow financial institutions (often local banks) to on-lend funds to entities wishing to improve their energy efficiency. The success of a credit line depends to a great extent on the selection of competent and committed financial institutions. A technical assistance component built into the credit line helps lower the technical and financial risk of projects.

# Designing Credit Lines for Energy Efficiency

## Why is this issue important?

### Investments in energy efficiency depend on the availability of credit

Many economically attractive opportunities to invest in energy efficiency are forgone because of various market barriers, notably the limited availability of commercial financing for energy efficiency projects. Once a government decides, as a matter of policy, to scale up energy efficiency, it typically must engage commercial banks to provide financing to the private end users who will carry out the energy efficiency projects needed to make the national policy a reality.

Credit lines help banks establish an energy efficiency business line by mitigating the perceived high financial risk of energy efficiency projects and of the energy service companies that carry them out, and sometimes by building into the credit line a technical assistance component to improve understanding of the fundamentals of energy efficiency projects. They also reduce the transaction costs of project finance by standardizing the process of project appraisal and loan processing. For project developers, credit lines expand the pool of commercial debt financing for their projects. The technical assistance component helps lower the perceived technical and financial risks of energy efficiency investments.

Energy efficiency credit lines make funds available to participating financial institutions (including local banks). Typically the credit line is extended to the financial institution as a low interest rate loan by a donor (such as a multilateral development bank or other international financial institutions) or by government. The recipient institution then on-lends the funds to borrowers (industries and other private entities) to invest in energy efficiency projects (figure 1). Targeted support for energy efficiency investments is warranted because current investment levels are suboptimal (Taylor and others 2008).

## How do the credit lines work?

### Four design features are critical to success

**Appropriate financing terms.** The donor or government agency usually extends the credit line to a participating financial institution (typically a bank) at its standard rate and tenor. The financial institution then on-lends to project developers at terms specified in legal agreements between the donor or government and institutions. For example, World Bank credit lines typically require that on-lending occur at market rates to avoid creating market distortions and competitive advantages and that the participating institution provide cofinancing on a one-to-one basis or better (table 1). For many projects, cofinancing has equaled or significantly exceeded Bank lending, but in at least one case it was less than 20 percent of the loan amount. Using its standard project-appraisal criteria, the financial institution will typically finance about 70 percent of a project's total investment costs, requiring the project host or energy service company to finance the remaining 30 percent through equity investments. The participating financial institution will also demand collateral, often 120 percent or more of the loan amount, because it assumes all repayment risks. In this way, a credit line can leverage funds both from the financial institution and the project developer.

When the donor agency providing the credit line is an international financial institution, funds for the line are either lent to the participating financial institution via the national government or directly to the institution with an accompanying guarantee from the government. The exchange rate risk is typically borne by the participating financial institution. Repayment occurs through the same channels followed to disburse the credit line (as shown in figure 1).

There is a risk that an energy efficiency credit line may end up subsidizing participating financial institutions, since financing from



**Ashok Sarkar** is a senior energy specialist in the World Bank's South Asia region.

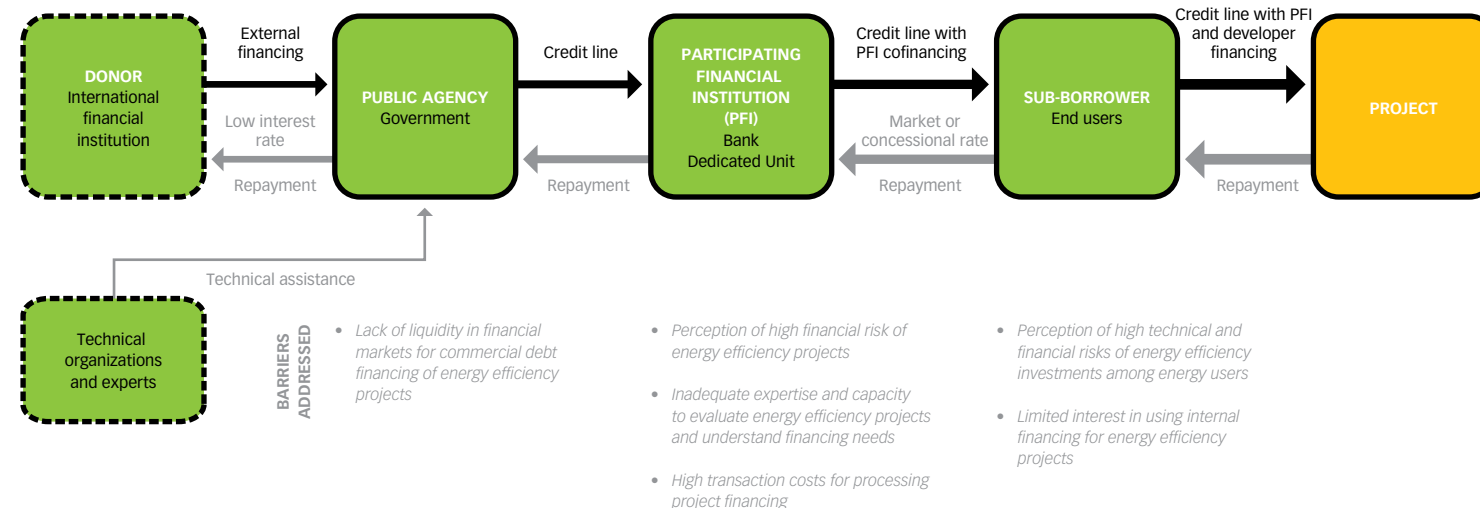


**Jonathan Sinton** is a senior energy specialist in the World Bank's Energy Practice.



**Joeri de Wit** is an energy analyst in the same practice.

**Figure 1.** Typical design of an energy efficiency credit line



N.B. Thickness of arrow represents relative size of financial flows to depict leveraging. Public agencies may offer credit lines without the aid of external donors (dashed border).

“There is a risk that an energy efficiency credit line may end up subsidizing participating financial institutions, since financing from international financial institutions is generally less costly than from other sources.”

international financial institutions is generally less costly than from other sources and participating financial institutions are required to lend at market rates. The logic behind the cheaper credit provided by the international financial institution is that it partially offsets the costs incurred by participating financial institutions in establishing the new business line in energy efficiency lending. Since many energy efficiency investments have shorter payback periods than the typical tenors of loans from international financial institutions, there is also a risk that funds provided for the credit line could be used simply to finance the balance sheets of participating financial institutions once the initial energy efficiency investments are fully repaid. One potential remedy is to require the participating financial institutions to roll over funds to new project lending. Another is for international financial institutions to shorten the tenor of loans for credit lines. A third solution may be to exploit the potential to combine credit lines for energy efficiency and renewable energy.

**Accurate targeting of end users.** The selection of the end-use sector to be targeted depends on the policy goals to which the credit line is designed to contribute. In practice, credit lines more

often target industry and large firms rather than smaller businesses and the residential sector. (This is the case for the World Bank credit lines described in table 1.) In part the bias toward larger enterprises is a consequence of the risk assessment and financial evaluation procedures that financial institutions use to determine whether a project developer will be eligible to borrow from it. Borrowers need to be creditworthy in the eyes of the lender, and most lenders do not recognize cash flow from energy savings as an acceptable form of collateral. The emphasis on asset-based or balance sheet financing limits lending to certain borrowers such as larger firms. Public sector agencies have rarely been the target of energy efficiency credit lines, those that KfW offers in Eastern Europe being an exception. Most commercial lenders are reluctant to provide debt financing to public sector agencies; reciprocally, most public agencies lack the inclination and capacity to borrow commercial funds on market terms.

**Project eligibility criteria.** The criteria for determining project eligibility can vary greatly depending on the end-use sectors targeted by the credit line, the amount of energy the user consumes, and the technical, social, and environmental characteristics of the project.

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The criteria may also include minimum energy savings or percentage savings. Portfolio risk management criteria usually preclude the commitment of a large share of the total amount of financing available through the credit line to any single project or company. (It would be undesirable to have the success of the credit line depend too heavily on just a few investments.)

**Technical assistance.** The type of technical assistance needed to support a new credit line depends on the sectors targeted, the capacity of the participating financial institutions, and the availability of other technical-assistance resources. The range of technical-assistance activities is broad: conducting market studies; developing appraisal procedures to assess energy efficiency cash flows and risks; developing financial products for energy efficiency projects; training staff of participating financial institutions; supporting pilot programs; marketing, monitoring and evaluating programs; disseminating experience and lessons learned; adapting and disseminating

planning tools; and supporting business development among energy service companies. To date, the most common focus of technical assistance has been building the capacity of participating financial institutions.

An example of how these features work in practice is provided in box 1.

### What have we learned?

#### Financial institutions are both the strength and the weakness of credit lines

Credit lines are just one mechanism for financing energy efficiency investments. Others include demand-side management by utilities, utility-funded consumer financing, energy efficiency funds, risk-sharing programs, energy saving performance contracting, and equity

**Table 1.** World Bank energy efficiency credit lines

Country	Launch year	Close year	Number of PFIs	Is the line specific to energy efficiency?	Target sector	World Bank financing (US\$ millions)	Cofinancing <sup>a</sup> (US\$ millions)	Cofinancing (percentage World Bank financing)	Total financing (US\$ millions)	Disbursement rate (percent)
China	2008	2013	2	Y	Large and medium industry	200	200	100	400	89
China	2010	2014	1	Y	Large and medium industry	100	500	500	600	20
China	2012	2016	1	Y	Industry, buildings, SMEs and ESCOs	100	200	200	300	0
China	2011	2016	3	Y	Industrial	133	134	101	267	11
China	2012	2018	2	Y	Buildings	100	100	100	200	0
Tunisia	2009	2014	2	Y	Industrial	40	80	200	120	18
Turkey	2009	2014	2	N	Industrial	600	550	92	1150	100
Turkey	2012	2016	2	N	Industrial	500	150	30	650	44
Ukraine	2011	2016	1	Y	Industrial, commercial and municipal	200	n/a	n/a	n/a	32
Uzbekistan	2010	2016	2	Y	Industrial	24	4.8	20	28.8	49
Turkey	2013	2018	3	N	Energy-intensive SME subsectors	201	50.25	25	251.25	7
Uzbekistan	2013	2016	3	Y	Industrial	99	43	43	142	14

Source: Limaye 2013.

Note: PFI = participating financial institution; SME = small and medium-size enterprise; ESCO = energy service company

a. Excludes financing from end users.

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“The unique feature of credit lines is their use of an existing delivery mechanism: the lending framework of the participating financial institution.”

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**Box 1.** Example of credit line characteristics: China Energy Efficiency Financing project (2008–14)

In the China Energy Efficiency Financing (CHEEF) project, the World Bank has provided a line of credit to three commercial banks in China—China EXIM Bank, Minsheng Bank, and Huaxia Bank—to enable them to finance energy efficiency projects.

**Financing terms.** The line of credit was structured as a financial intermediary lending operation with a sovereign guarantee from China’s Ministry of Finance. The World Bank loan was based on the London Interbank Offer Rate (LIBOR), was denominated in U.S. dollars, and has a variable spread. East of the three banks received \$100 million to be repaid in 17.5 years, including a grace period of five years. The funds were on-lent by the Ministry of Finance to the three banks at the same financial terms and conditions, and were in turn loaned by the banks at market rates to industrial enterprises and energy service companies. The participating banks are responsible for debt servicing and bear all of the financial risks associated with the World Bank loan. The World Bank required each bank to invest an additional \$100 million or more of its own resources in energy efficiency projects overall, while the participating banks required enterprises to which they made project loans to contribute about 30 percent of project costs. The banks in turn required loan recipients to contribute about 30 percent of the project costs. A Global Environment Facility (GEF) grant was used to provide technical assistance.

**Targeted end users.** The targeted end users are medium and large industrial enterprises in China having total annual revenues of at least CNY 30 million (\$4.7 million), based on audited income statements no more than two years old. Under CHEEF III, sub-borrower eligibility was expanded to include industrial enterprises of all sizes, energy service companies (including leasing companies), and owners of buildings.

*Source:* Wang and others 2012.

**Project eligibility.** Investments must be in renovation or rehabilitation. Any new construction must be within the boundaries of the existing premises. The cash flow benefit arising from energy savings associated with the project, as reviewed by the participating financial institution, must be adequate to repay the total investment cost of the subproject within 10 years. The sub-borrower must obtain approval from the appropriate Chinese environmental authorities.

**Technical assistance.** The GEF grant is used to train personnel in participating financial institutions; to develop new financial products for energy service companies; to adapt loan appraisal and underwriting criteria to energy efficiency investments; to conduct market-segment studies to broaden the end-use sectors and technologies in the portfolio; to build partnerships and engage selected bank branches in market development and in generating deals; and to develop market aggregation tools for projects and for small and medium-size enterprises. Policy-related technical assistance focused on helping the National Development and Reform Commission to develop market-based mechanisms, such as schemes for trading energy savings certificates; developing and implementing high-priority energy conservation programs during the 12th Five-Year Plan (2011–2015); and strengthening the National Energy Conservation Center.

The credit line leveraged \$462 million from participating banks and industrial enterprises—a leverage ratio of 1:4. The investments made possible by the credit line are expected to save 1.7 million tons of coal equivalent (1.2 million tons of oil equivalent) and to reduce CO<sub>2</sub> emissions by 4.2 million tons each year.

funds. All of these mechanisms work best within a context of clear national objectives for energy efficiency and supporting policies that create a market pull for investments in efficiency.

The unique feature of credit lines is their use of an existing delivery mechanism: the lending framework of the participating financial institution. This delivery mechanism presents both advantages and limitations. Where the existing lending framework has well-established project-appraisal procedures and institutions have a deep fund of professional expertise, implementation of the credit line may be quick and easy. Where participating financial institutions have limited capacity to manage energy efficiency projects, the credit line’s effectiveness may be limited, and project-appraisal procedures

may restrict the pool of borrowers that can be reached by the credit line. Still, for donors, credit lines entail minimum risk, as the funds are guaranteed by the national government. Furthermore, credit lines can be instrumental in developing the market for energy service providers.

Accumulated experience with energy efficiency credit lines is leading to the identification of good practices for design and implementation. In general, as with all types of support mechanisms, a credit line should be adapted to context, which includes the national economic, financial, legislative, and regulatory framework, as well as the specific characteristics of participating financial institutions, project developers, and targeted projects.

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The overall success of a credit line depends to a great extent on the selection of competent and committed financial institutions. Institutions need management with an interest in and willingness to engage in energy efficiency as a new business line, as well as good access to, knowledge of, and relationships with the target market. Institutions should already be familiar with the sectors they intend to target. To deploy credit lines targeting small and medium-sized enterprises in India, JICA and KfW worked with the Small Industries Development Bank of India, which had the requisite experience with such customers. It is essential, too, that the institutions develop or work with a technical team that is experienced in energy efficiency technologies and their benefits. The energy efficiency business line should be handled by the department responsible for commercial loans to the target clients. Staff in the department should be motivated to develop business through performance incentives and other commercial management tools.

Technical assistance can help many financial institutions get the credit line working faster. To create a market conducive to sustained energy efficiency investments, capacity building for participating financial institutions and for the broader energy efficiency network is recommended. Technical assistance offered to end users and government can help develop the broader energy efficiency market, stimulate interest in energy efficiency projects, disseminate the positive results obtained from the credit line, and encourage other banks and local financial institutions to increase their lending for energy efficiency projects.

Concessional funding remains a major factor in securing the interest of small and medium enterprises in energy efficiency. Because the appraisal criteria of most financial institutions favor the financing of larger, more creditworthy energy users with strong balance sheets, a credit line targeted at small and medium enterprises or public sector projects may require credit-enhancement techniques and much more forceful market-development efforts.

On the operational front, simplifying project review and appraisal procedures wherever possible and integrating them into the financial institution's own systems can accelerate deployment of the credit line. The best example of this is JICA's credit line to SIDBI (India), in which simple eligibility criteria (projects were eligible if they included preapproved technologies or equipment) allowed loan officers to quickly appraise a project, enabling SIDBI to make a large number of sound loans very quickly.

A last word. It should be kept in mind that a credit line that is jointly offered for both renewable energy and energy efficiency may tend to find more uptake in renewable energy investments than in energy efficiency investments, possibly because renewable energy projects are larger, have proportionally lower transaction costs, and involve assets that are easier to use as collateral.

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