

What is cogeneration?

Cogeneration, or Combined Heat and Power (CHP), is a technology used to produce electricity and heat from a single source. This allows for up to 90% total efficiency, compared with 35% for conventional electricity generation, generating significant energy cost-savings for end-users.

How do projects work?

- **Project structures:** Cogeneration projects are often implemented by Energy Services Companies (ESCOs), and structured either through a Special Purpose Vehicle (SPV) set-up by investors, or with individual end-users, such as industrial companies. There are two basic project schemes:
 - Project finance:** The sponsor establishes a SPV with the objective to own and operate a cogeneration system. Assets of the company are represented by the co-generator facilities, and investment return is assured by two revenue streams: one is heat sales to end-user companies (10-20%) and the other is electricity sales to the grid (80-90%), often based on a preferential feed-in tariff established by electric utilities as an incentive. Borrower is the SPV.
 - Corporate finance:** The end-user company purchases, installs and operates the cogeneration equipment and utilizes the generated electrical and thermal energy for its own purposes. The investment costs are entirely or partially paid back by energy cost savings accumulated by the end-user. Borrower is the end-user.
- **Collateral:** Under both structures, cogeneration units serve as collateral.
- **Key success factors:** Installation of high quality, site-tailored equipment, optimizing projects to achieve critical efficiency levels (minimum of 65-75%), and accurate operation and maintenance of cogeneration facilities are key success factors.
- **Carbon credits:** Projects may qualify for carbon emissions reduction certificates, which further enhances project revenues.



What are the opportunities for financial institutions (FIs)?

- **Access to large market:** End-users include: processing industries (cement, brick, minerals, food, textiles, and paper); commercial sector (hotels, offices, and retail complexes); and public sector (hospitals, universities, and district heating).
- **High growth potential:** Due to rising energy prices, energy efficient technologies, such as cogeneration, are increasingly attractive to end-users. Companies, particularly, are seeking ways to improve operational efficiencies and business performance in highly competitive domestic and international markets.
- **Improved client service:** Beyond attracting potential new business volumes, cogeneration finance is a cross-selling tool for FIs to serve existing clients with a more sophisticated product package.
- **Market differentiation:** By developing services tailored to energy efficient technologies, FIs can profit from “first-mover” advantages as a market innovator to increase their market share.
- **Increased brand value:** FIs can enjoy reputational benefits with policy makers, customers and shareholders by supporting energy efficiency projects that reduce energy use and environmental emissions.

Sample Cogeneration Project for Paper Mill

30% energy savings with coal-fired boiler

Annual heat consumption	100,000,000kWh
Annual electricity consumption	35,000,000kWh
Price of coal	\$0.02/kWh
Price of electricity	\$0.06/kWh
Energy saving	30.0%
Energy saving	40,493,411/kWh
Energy cost before cogeneration	\$4,452,941
Energy cost with cogeneration	\$3,640,000
Energy cost-savings	\$812,941
Investment cost	\$3,000,000
Payback period	4 years

What are the key issues—questions to ask?

- **FI products and processes:** What internal resources exist to support cogeneration lending?; Is there an appropriate loan product to finance cogeneration projects?; What is the availability of medium-to long-term financing, and at what terms?
- **Credit risk:** Is the financial institution comfortable with the borrower credit risk? And with the project type?

- **Technical Assistance:** What is the level of understanding of cogeneration transactions within the FI? Is technical assistance needed for internal training and institutional capacity building to implement this type of lending?
- **Regulatory incentives:** Does the country allow release of excess electricity to the grid? Are there preferential tariffs for electricity produced from cogeneration? Can the project generate carbon emissions reductions certificates? Is there a need to raise public/government awareness?

How can IFC help?

IFC has over ten years experience working with leading financial institutions in the area of energy efficiency finance, supported by world class experts. IFC's offering includes:

- **Partnership:** IFC partners with selected client FIs to assess market potential for developing a pipeline of bankable cogeneration projects.
- **Product design and structuring:** IFC can provide sectoral and project expertise to assist FIs in product design and the financial structuring of projects.
- **Financial product offering:** IFC offers flexible finance options to FIs for cogeneration-targeted lending, including medium to long term credit lines and guarantees. In some cases, IFC may also offer special financial enhancements, such as performance incentives once targets are achieved.
- **Technical Assistance:** IFC may also provide customized technical assistance, including: advisors; market analysis; feasibility studies; engineering support; energy audits; energy savings calculations; and capacity building programs.
- **Ongoing innovation:** IFC continuously develops its own offering in the area of sustainable energy finance based on years of project experience, client needs and market developments. New products include assisting client FIs and their customers to access additional revenue streams from carbon credits as an added benefit to sustainable energy projects.

Who to contact at IFC?

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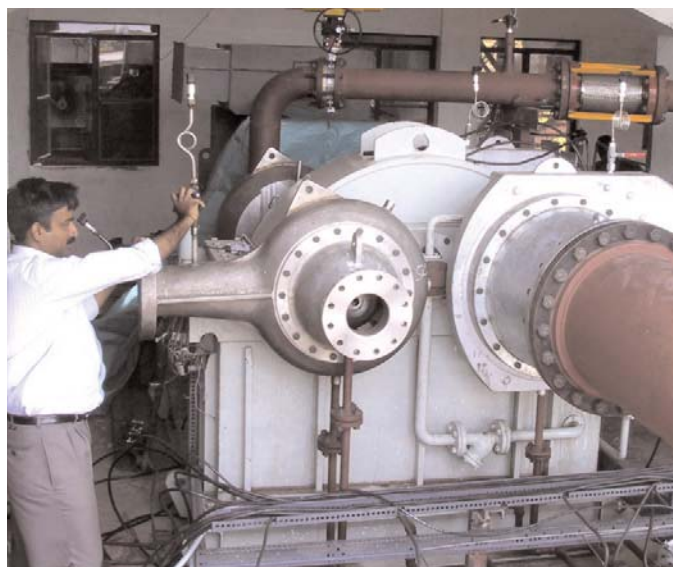
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Success Stories: Commercial Sector Cogeneration, Hungary

Purpose	IFC partial credit guarantee to bank to finance outsourcing of heat production by industrial companies via installation of cogeneration units
Borrower	SPV, owned by the project sponsor group
End-User	Large industrial companies, tourism resorts, municipalities
Debt/equity	90/10
Simple Payback	5 to 8 years
Energy results	Modernized heat and power production, distribution and management; reduced greenhouse gas emissions by 29,000 tonnes per year



The mission of IFC is to promote sustainable private sector investment in developing and transition countries, helping to reduce poverty and improve people's lives. Since its founding in 1956 through FY05, IFC has committed more than \$49 billion of its own funds and arranged \$24 billion in syndications for 3,319 companies in 140 developing countries. For more information, visit www.ifc.org.