The steam produced when heated water boils and evaporates is used for a wide range of purposes at manufacturing sites and various other kinds of facilities. During manufacturing processes, this steam is reduced to the necessary pressure by the steam reducing valve, but the excess steam generated during this pressure reduction process is discharged into the atmosphere without being used. Steam power generation has been drawing attention as a way to effectively use excess steam without wasting it. In 2001, Kobe Steel initiated research efforts aimed at the effective use of steam and started accumulating technical expertise and know-how in steam power generation through NEDO projects. In a user survey conducted at the time, it was revealed that steam demand for most users was less than 1 MPa, which is 2 to 20 tons of steam flow per hour. Steam used in small- to medium-sized factories, which account for a large percentage of Japan’s manufacturing sector, is low-volume, low-pressure steam. To use the steam for processing, there is a need for high-precision control of steam pressure reduction functions at factories. If energy is collected efficiently from the steam and high-efficiency power generation can be achieved while also reducing its pressure with a high degree of precision, it would be killing two birds with one stone.

In light of these surveys, Kobe Steel has been developing practical, compact high-efficiency steam generators since 2004. The company elected to develop its micro steam energy generator SteamStar™ by incorporating a screw-type method rather than a turbine and applying technologies developed through NEDO projects. Kobe Steel offers 132 kW and 160 kW power-generating capacity units and has sold 80 SteamStar generators to date.
Q. Why did this project start?
Japan relies on the majority of its energy resources on overseas imports, and global fluctuations in the demand for energy have a large impact on social and economic aspects of the country. The second oil crisis in the 1970s in particular highlighted the need for more stable energy supply systems and better energy conversion and usage efficiency. The “Moonlight Project” that began in FY1978 triggered the start of a national project to provide support for the development of high-efficiency gas turbines required for thermal power generation.

Q. What was the aim of the project?
In Europe and America, development of high-efficiency gas turbines had already begun as national policy in the 1970s, in an attempt to become more competitive internationally. In Japan, the gas turbine market was so small at the time that equipment was imported from America. Yet when considering Japan's position in the future, including improving national strength and addressing environmental issues, there lies the need to acquire the technical capabilities to develop gas turbines within Japan as soon as possible. It was with this in mind that a national project was established to develop a high-efficiency gas turbine on par with European and American counterparts.

Q. What is the role of NEDO?
Development of gas turbines involves high risk and large funding, making it difficult for individual companies to embark on such projects. The “Moonlight Project” that began from FY1978 was a project that took on a nationwide scale to develop various types of technologies required for high-efficiency gas turbines. NEDO also followed this up by organizing the “New Sunshine Project” from FY1988 with the aim of achieving even greater efficiency.

From FY2004, the national project “Development of Elemental Technology for High-efficiency Gas Turbines” organized between different government agencies involved industry, government and academia. NEDO continues to support development of elemental technologies through national projects such as these.