

Big increase for MITI budget emphasizes energy technology

Tokyo. Japan's Ministry of International Trade and Industry (MITI) last week applied for its largest budgetary increase for research in more than a decade.

The increase of 16 per cent for the fiscal year beginning 1 April 1993 would come largely from a new special account of ¥142 billion (\$1.1 billion) created by the ministry to promote development and use of technology to reduce carbon dioxide emissions and energy consumption. The ministry will use surplus funds and borrow money to finance the account in 1993, but the Japanese government must impose some new form of tax in subsequent years.

MITI's research and development budget has increased in recent years by only a few per cent a year, barely enough to keep pace with inflation. The ministry has been forced to reduce its general expenditures under a policy aimed at reducing the deficit, and its budget has grown only through separate special accounts financed by taxes on oil and electricity. The extra money in 1993 will come from a new special account.

The budget request must be screened by the Ministry of Finance and approved by the Diet before it goes into effect. But few changes are likely.

Of the ministry's overall request of ¥900.6 billion, ¥282.7 billion will go towards efforts to save energy and to protect the environment. This increase of 55 per cent is made possible with the new account. Much of the extra money will go into subsidies to encourage industry to reduce its consumption of energy, to recycle goods and to introduce substitutes for chlorofluorocarbons (CFCs).

The ministry's proposed research and

development budget of ¥301.3 billion includes a consolidation of projects related to energy and the global environment under one umbrella called the New Sunshine Project. This project, with a proposed budget of ¥55.7 billion, is the successor to the Sunshine Project (started in 1974 to develop alternative sources of energy), the Moonlight Project (initiated in 1978 to develop technology to conserve energy) and the ministry's recent projects to develop environment-friendly technology. But the research budget also includes several new initiatives, among them a proposal to spend ¥50 billion in the next seven years on technology to use some of the heat generated from cities.

The ministry plans to spend ¥300 billion during the next 27 years on an international project to develop 'clean' hydrogen energy. The idea is to develop technology to help countries rich in hydroelectric energy, such as Canada, to extract hydrogen from water by electrolysis and to sell the energy.

The special account would also support a ¥23.3-billion programme to sell environment-friendly technology developed in Japan, such as desulphurization plants, to developing countries. And the recently formed Research Institute of Innovative Technology for the Earth (RITE), which is developing substitute CFCs and ways to absorb CO₂ with help from Japanese industry, gets a boost of from ¥5-7 billion.

A long-term source of funds must be found to maintain such programmes. The three leading candidates are an environment (or CO₂) tax on energy use, a tax to support international activities including research and a tax on crude oil imports like that temporarily imposed to fund Japan's \$9-billion contribution to the Gulf War.

Apart from energy-related research, MITI would like to spend ¥3.6 billion to get its new Real World Computing Project, the follow-up to the fifth-generation computer project, into full swing next year. Its centre will be a new research institute in Tsukuba science city linked by a high-speed computer network to 20 satellite research centres in Japan and to several overseas.

The project is intended to develop new massively parallel computers, optical computers and neural network computers. In contrast to the fifth-generation computer project, which relied on the

domestic development of technology, the Tsukuba centre will lease a parallel computer from Thinking Machines Inc. of Cambridge, Massachusetts. Next month, German researchers will become full participants in the project, soon to be joined by researchers from the Korea Advanced Institute of Science and Technology in South Korea. But the United States will be involved only in one small part of the optical computing section (see *Nature* 356, 734; 1992).

The fifth-generation computer project, which by most accounts has been a failure,

More for space and genome database

Tokyo. There are few surprises in the budget request released last week by Japan's Science and Technology Agency. Spending on space would grow by nearly 10 per cent to pay the rising costs of Japan's contribution to US Space Station Freedom and the increased development costs of Japan's next-generation H-II rocket, plagued with accidents and delays. The Human Genome Project appears to receive a large increase, but a substantial portion would go for a computer link with the Genome Data Base at Johns Hopkins University in Baltimore. **D.S.**

has been extended with a shrunken budget of ¥1.4 billion. This will support 30-40 researchers, about 30 per cent of the current number. The goal is to make the fifth-generation computer compatible with standard computers with UNIX operating systems to increase its applications (*Nature* 357, 619; 1992). The ministry has also asked for ¥1.2 billion to begin its Intelligent Manufacturing System (IMS) project, although negotiations are still under way with the United States, Europe and other partners to shape this international effort to develop the automated factories of the future.

Another significant change in next year's budget is the joining of MITI's large-scale projects to promote industrial development of new technologies with smaller next-generation industrial projects. Their budgets are combined into a new category called Industrial Scientific Technology.

MITI's search for alternative sources of energy has led it to back some long shots. The ministry's Natural Resources and Energy Agency has requested ¥300 million for technology to extract heat from cold-fusion experiments in which an electric current is passed through palladium electrodes immersed in heavy water. The agency hopes to spend ¥2.7 billion during the next four years on applications of cold-fusion technology (see *Nature* 358, 268; 1992).

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Some highlights of MITI's R&D budget

(in billion yen, ¥125 = \$1)

	1993 proposed	% change from 1992
Total R&D budget	301.3	+16.0
including such programmes as:		
Japan Key Technology Centre	29.0*	+1.7
Industrial Scientific Technology	25.9	+9.7
New Sunshine Project	55.7	+10.7
Green Aid Plan	23.3	+862.9
Real World Computing Project	3.6	+400.0
Fifth-generation Computer	1.4	-62.0
Intelligent Manufacturing System Project	1.2	+50.0
Human Frontier Science Programme	4.0**	+4.0
NEDO International Grants	0.9	+35.3
Hydrogen Energy (cold fusion)	0.3	—

*Budget shared with Ministry of Posts and Telecommunications

**Budget shared with Science and Technology Agency