

**Research Plans
&
Statement of Budget
FY 2011**

March 2011

Central Research Institute of Electric Power Industry

Notice of Revision to Fiscal 2011 Research Plans

As we wrote in this research plan and statement of revenue and expenditures, in order to support the electric power industry's foundation into the future and realize a low-carbon, sustainable society, we have established a plan and budget for fiscal 2011 that focuses on research on Nuclear Technology, Stable Power Supply Technology, and Environment and Energy Utilization Technology.

However, as a research institute whose mission is to support the electric power industry with research and development, the Great East Japan Earthquake that struck on March 11, 2011 has caused us to begin to consider the areas we should pursue in R&D. Accordingly, we continue to revise our research plans in light of the current situation.

We plan to revise our fiscal 2011 research plan once we have revised our policy, and ask for your understanding in advance.

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Research Plans

Preface

The current socio-economic order differs significantly from what we have been used to.

Inter-nationally, as emerging countries achieve economic growth and developed countries stagnate, it is becoming increasingly difficult to use conventional frameworks to address issues such as heightened competition over securing resources, volatile resource prices, and difficult negotiations over prevention of global warming. Moreover, in Japan, there are no signs of economic recovery despite a ballooning fiscal deficit, and at the same time the social structure is changing as domestic industries are hollowed out, the birth rate declines and the population ages. This is reinforcing the sense of stagnation in the society at large. These factors have a significant impact on the electric power and energy sector. Moreover, not only do we currently see a sluggish recovery in electricity demand in the industrial sector as a result of the stagnant economy, but this business environment is expected to become even harsher in the medium to long term as fuel procurement costs rise, environmental investment spikes, and energy demand falls as the population declines with the low birth rate and aging population.

These domestic and international changes will force the electric power industry to take up new reforms that go beyond conventional concepts and structures. To pave the way, the electric power industry is expanding its business domains and proactively pursuing initiatives aimed at sustainable development, such as creating new demand by introducing electrification to homes, reinforcing overseas projects, and enhancing human resource development. Moreover, because a steady and reliable supply of electricity is the unchanging mission of the electric power industry, the electric power industry is focusing on taking steps to effectively utilize power facilities for the long term and addressing a wide range of risks such as natural disasters. Furthermore the electric power industry also continues its work to reduce the carbon emissions of power sources, with nuclear power playing a key role.

CRIEPI's mission is to support the electric power industry with research and development activities. As such, we use our knowledge and technology to resolve the problems confronting the electric power industry and society. In fiscal 2011, we intend to produce results from our research into our three main research areas: Nuclear Technology, Stable Power Supply Technology, and Environment and Energy Utilization Technology. In addition, recognizing the future trends and changes in the electric power industry and society, we aim to lay out logical and effective solutions for issues such as the maturation of the electric power industry and saturation of power demand and issues related to heightened risks, as well as the issues involved in creating a future society by advanced electrification that will enhance the potential for and value of electricity's use in a wide range of technologies embraced by society.

CRIEPI will commemorate the sixtieth anniversary of its founding in fiscal 2011, which offers an ideal opportunity to look to the future, develop a new framework for the research institute and take the next leap forward. In this spirit, we will strive to build a solid foundation for the future in fiscal 2011. Specifically, we will begin by laying the groundwork at our laboratory in Yokosuka, the cornerstone of the work we have begun in rebuilding our research bases to ready them for the pursuit of new research. Moreover, in light of the reformation of public interest corporation system in Japan, we will make practical changes to earn designation as an independent administrative institution so that CRIEPI can continue to produce high-quality research results and contribute extensively to the electric power industry and society with flexibility.

⟨Research Activities⟩

In fiscal 2011, we will strive to achieve solid results in our current projects focusing on Nuclear Technology, Stable Power Supply Technology, and Environment and Energy Utilization Technology, as well as research into fundamental technology intended to expand our areas of expertise.

We will particularly focus on the following project issues, meeting the needs of the electric power industry and society by achieving and utilizing timely results.

- (1) In the area of Nuclear Technology, which plays an important role in providing stable electricity supply and measure to global warming, we will steadily research issues such as Plant Life Management of Light Water Reactors and Nuclear Fuel Cycle Backend Technology.
- (2) In the area of Stable Power Supply Technology, we will research the Operation and Maintenance of Electric Power Transmission and Distribution Facilities as well as Next-generation Thermal Power Technology, which contributes to effective resource utilization and reductions in CO₂ emissions.
- (3) In the area of Environment and Energy Utilization Technology, we will proactively research Global Warming Prediction and its Impact Assessment, Electrification and Energy Conservation Technology, and Next-generation Power Grid Technology aiming for the smooth introduction of renewable energy to the electric power system.

In pursuing our research, we will focus our efforts as follows.

- (1) Deepening and strengthening research activities aimed at exercising our strengths to the fullest by consistently improving the quality of our research capacity—CRIEPI's very foundation—and forming external and internal affiliations
- (2) Strategically pursuing research that leads to Effective Energy Use and a Future Society by Advanced Electrification
- (3) Appropriate management and more active utilization of intellectual property to fully utilize research results in electric power industry and society (outcome)

⟨Operation Management⟩

We will take the following initiatives to develop a new framework at our research institute to facilitate research development going forward.

- (1) Make steady efforts to rebuild research laboratories in Yokosuka and other regions
- (2) Take steps to set up institutional design and internal control systems as part of our transition to a status as an independent administrative institution to respond to the reforms of the public interest corporation system
- (3) Reexamine all research activities to prepare for future expansion by improving employee recruitment to encourage individuals to exercise their unique skills and strengthening information dissemination and public relations activities to enhance CRIEPI's value

⟨Income and Expenditure Budget⟩

Based on strict cost awareness, we allocate our research resources appropriately to both the pursuit of current research subjects and the development of a foundation for future expansion, and also strive to more effectively utilize existing assets.

Research Activities

I. Research Plans

CRIEPI carries out research aimed at securing energy security and addressing global environmental problems in three overarching categories: Nuclear Technology, Stable Power Supply Technology and Environment and Energy Utilization Technology. We not only develop technology on the supply side, such as research on measures to address aging power supply facilities and high effective electric power generation, but we also promote the development of technology that will create a low carbon society, including the use of renewable energy such as biomass and efficient energy use on the demand side.

In fiscal 2011, we plan on conducting the following research and achieving steady results.

1. Project Subjects

We select issues on which the electric power industry and society have a great need for research and that require timely results and applications as our 38 project subjects. We then capitalize on CRIEPI's collective strength to promote research in these subjects. The main research to be carried out is described below.

(1) Nuclear Technology

Nuclear power technology supports the foundation for a stable supply of electric power into the future and also plays an important role in countering global warming. Accordingly, CRIEPI steadily carries out research on plant life management of light water reactors, nuclear fuel cycle backend technology, improvement of earthquake resistance assessment, next generation reactor and, advanced fuel cycle technology and radiation safety.

Research on Plant Life Management of Light Water Reactors: We carried out research on irradiation embrittlement, stress corrosion cracking (SCC) and pipe wall thinning, among other subjects, in line with the national road map for R&D on measures to address aging plants. This research will facilitate the rational and highly reliable operations at the light water reactors that have been operating for over 40 years. We will conduct research to identify the mechanism of irradiation embrittlement under high irradiation environment, with the aim of expanding the application of the prediction method that we developed. We will also promote research to clarify the mechanism of SCC propagation in components and piping, and the thinning mechanism of vapor and liquid two-phase flow piping, as well as continue to develop prediction methods and evaluate the seismic reliability of thinned piping. Moreover, we develop an advanced non-destructive inspection method for SCC and a method for diagnosing and assessing the deterioration of electric power cables caused by nuclear radiation and heat.

Nuclear Fuel Cycle Backend Technology: We will develop technology designed to mitigate SCC in the metal canister in the storage concrete casks which offer such promise as a next-generation storage method for spent fuel. The results will then be reflected in a specification for concrete cask storage. Moreover, we will enhance the performance assessment of the engineering barrier materials that play an important role in the deep subsoil disposal of low level radioactive waste, and will develop methods for material durability resistance inspections using the Torrent air permeability test. Our

research on the disposal of high level radioactive waste will include the long-term deformation behavior evaluation on the bedrock near the disposal hole and the engineering barriers by scaled tests using centrifugal loading apparatus.

Improvement of Earthquake Resistance Assessment: With the aim of developing qualified earthquake resistant design practices for nuclear power civil engineering structures, we will provide index showing the coupling of active fault movement to assess reference seismic ground motions, as well as integrate the procedures for developing a deep subsurface structure model to more accurately estimate the seismic wave amplification characteristics. In addition, we will develop and verify evaluation methods for tensile strength of the bedrock and shear strength with weak layers. This is essential in a qualified seismic stability of bedrock.

Next Generation Reactor and Advanced Fuel Cycle Technology: Based on various data acquired thus far in experiments using uranium and plutonium, we will develop a highly practical flow sheet of dry reprocessing for the metallic fuel cycle, as a future optional technology for fast breeder fuel cycle. This research is in anticipation of the FY2015 national level research development assessment. We will also evaluate the structural integrity for irradiation of metallic fuels and develop a dry reprocessing device using a large glovebox with argon gas atmosphere.

Radiation Safety: With a view to optimizing radiation protection standards based on scientific data, we will continue to accumulate biological response data under low dose and low dose rate radiation conditions using cell cultures and laboratory animals (mice). We will also develop a model for quantitative assessment of the risk of low dose radiation based on the above data. In addition, we will systematically compile epidemiological data collected for residents of High Background Radiation Area (HBRA) over a long period. Moreover, we will proactively disclose this information with the aim of reflecting the findings and data in international radiation protection standards.

(2) Stable Power Supply Technology

We will steadily develop rational technology for the diagnosis, operation and maintenance of aged electric power transmission and distribution facilities as well as technologies addressing snow damage to electric transmission plants in order to ensure a stable supply of electric power. Moreover, we will carry out research on raising the reliability of electric power plants, such as lifetime assessments for the welded part of the high-chrome steel piping in pulverized coal power plants, and develop technology to expand the range of fuels used, such as the effective use of low grade resources.

Operation and Maintenance of Electric Power Transmission and Distribution Facilities:

To establish proper operation methods of fast-increasing highly aged transmission and distribution facilities, we will compile and accumulate data on the deterioration of highly aged 22kV-66kV class XLPE power cables. As far as an evaluation of wind, snow storm and salt damages on transmission and distribution facilities, considered as a great important issue in the electric power industries, is concerned, we will examine technologies that predict snow storm damage and the effect of damage reduction measure products, based on field observations, laboratory experiments and numerical analyses results. We will also analyze the effect of PCB

removal in field tests, examine cleaning standards, and develop an on-site analysis method in order to apply the cleaning technology—proposed by CRIEPI and adopted as Japan's technology for processing transformer contaminated with low levels of PCBs—to onsite processing of large contaminated transformer.

Maintenance and Operation of Electric Power Generating Facilities: In order to develop a life assessments method for the welded part of high-chrome steel piping, which are essential for the appropriate operation and maintenance of high efficiency coal-fired power plants, we will carry out long-term material property evaluation tests of the circumferential welded pipe same as used in an actual boiler and collect the material strength data. This is a follow-up of similar tests on the longitudinal welded pipe. We will also establish guidelines for a seismic performance verification to be used for the dam embankment and spillway gate of gravity dams to make practical the seismic performance evaluations for aged dams.

Next-generation Thermal Power Technology: We will propose operation guidelines for pulverized coal boilers in low load operation where the blend rate of subbituminous coal into bituminous coal is 50% or more in order to reduce CO₂ emissions through the effective and efficient use of low grade resources. Moreover, we will examine the operating condition optimization system for coal gasifiers developed by CRIEPI using data on Nakoso IGCC (Integrated coal Gasification Combined Cycle) demonstration plant. We will also clarify the operation condition optimization system for coal gasifiers we have developed thus far as we proceed with our research on the next generation IGCC system with CO₂ capture, a future technology proposed by CRIEPI. Moreover, in our research on carbonizing gasification technology, the key to more advanced use of wood and waste biomass, we will obtain basic carbonizing properties of them to be reflected in an experimental design using large-scale research facilities which will be complete in fiscal 2012.

(3) Environment and Energy Utilization Technology

We will steadily promote environmental research with a focus on global warming forecasting and assessments of its impact. Moreover, in our efforts to realize a low-carbon society in the future, we will promote the efficient use of energy with low-loss power semiconductors and high-performance heat pumps, expand applications for electrification technology, and proactively develop technology such as Next-generation Power Grid Technology to facilitate its adoption in power systems for the generation of renewable energy sources such as solar energy.

Global Warming Prediction and Its Impact Assessments: To support the examination of measures mitigating global warming caused by CO₂ emissions, we will develop tools enabling simple assessments, such as the evaluation of climate change caused by a designated emission reduction measure and the evaluation of the economic impact of this climate change. Moreover, we will predict changes such as typhoons and heavy rain consequent with the global warming climate and identify the impact of these changes on hydroelectric power generation facilities and transmission facilities. This eventually promotes discussions on adaptation issues for global warming in the electric power industry.

Electrification and Energy Conservation Technologies: We will develop technologies such as methods for measuring oil-mist generated during cooking and for designing

adequate ventilation hoods, in order to support optimal design of electric kitchens. We will also ascertain the performance of the next-generation compact heat-pump water heaters (Eco Cute) in field tests using Eco Cute performance assessment technology developed by CRIEPI. Towards low-loss power semiconductor devices, we will develop technology of SiC crystal growth with a higher growth rate and low defect density. Moreover, in the development of all-solid-state lithium polymer secondary batteries for home use, which are extremely safe, thus far we have developed cycle life extension technology of both the positive and negative electrode, but we will examine technology to extend battery cycle life with the trial manufacture of a large battery with optimal balance between the positive and negative electrodes in the initial capacity. In secondary battery utilization technology, we will propose measures to popularize electronic vehicles at the urban level with a comprehensive summary of their effect in reducing environmental impact, optimization of infrastructure, and driving performance.

Next-generation Power Grid Technology: As the required regulating power will increase in a power system with massive introduction of photovoltaics (PVs), we will propose a coordinated operation methods of customer's electrical appliances to relieve the burden on generation plants. We will also provide a detailed design of the customer gateway that will centrally handle the control information for the PV storage battery and appliances, and the household energy use information in order to develop practical communication infrastructure required for the next-generation electricity grids.

Energy Policy Analysis: To review the options for regulatory reform in the electric power industry, we will evaluate the current situation in other countries that have already fully deregulated retail power market and analyze the issues with Japan's approach to the electric power market. We will also compile information on the approach to energy technology policy, such as the development of renewable energy and energy-conserving technology and strategies to popularize such technology and technology transfer to developing countries, as well as the assessment of its impact on the electric power industry and society. We will make proposals based on this.

2. Fundamental Technology Issues

Fundamental technology issues are the source of solutions to the issues we face. Accordingly, we will designate 36 fundamental technology issues to guide our research with the aim of enhancing fundamental technology capacity, while capitalizing on the strengths and specialized skills of eight laboratories with specific research fields*.

Specifically, we will steadily conduct research on technologies that would maintain, sustain or develop, including the Analysis and Control of Electric Power Systems, Electrical Insulation, and Natural Disaster Countermeasures, and technology expected to become core next-generation technology with new potential, such as the Analysis and Assessment of Thermal Hydraulic Indices, Advanced Materials, and Biotechnology Applications.

*Socio-economic Research Center, System Engineering Research Laboratory, Nuclear Technology Research Laboratory, Civil Engineering Research Laboratory, Environmental Science Research Laboratory, Electric Power Engineering Research Laboratory, Energy Engineering Research Laboratory and Material Science Research Laboratory.

II. Research Promotion

With the aim of further extending and advancing our fundamental research capacity, we carry out research with a clear idea of the role of each research issue and awareness of the three perspectives* to optimize the academic, social and economic spillover effect (outcome) of our research results on the electric power industry and society. We also consistently follow PDCA in our research on these issues and meet the power industry and society's expectations.

Our specific endeavors are described below.

- * I. Research that the electric power industry must resolve in the future, no matter how society changes
- II. Research that should be carried out to prepare for major risks in the future
- III. Research capable of defeating constraints with technological breakthroughs

(1) Enhancing Research Capacity and Exerting Comprehensive Strength

The ability of researchers lies at the root of research capacity, and CRIEPI's main asset is the knowledge and technique of our individual researchers. This means that extending and enhancing these skills would further raise the potential of our research. Accordingly, we will unceasingly engage in trial and expeditious research activities based on the researchers' own concepts.

Moreover, we will exercise our comprehensive strengths by promoting cross-cutting research by coordinating with eight professional research institutes in our search for resolutions to the increasingly complex and diverse issues we face. In particular, we will compile internal and external knowledge for study and analysis and designate prospective research topics in order to strategically promote research that will shape the role of electrification in our future society—the kind of research that can impact the electric power industry and society. Moreover, we will integrate and combine CRIEPI's internal research skills by rebuilding a research base in the future and establishing an environment that promotes research with organic affiliations between researchers and administrative staff. This will enable us to accurately meet the needs of the electric power industry and society.

In addition, we will carry out research in affiliation with domestic and overseas university and research institutions with impressive knowledge in specific fields (the Institute for Transuranium Elements (ITU) of European Commission, the National Center for Atmospheric Research, the Japan Atomic Energy Agency, and the Marine Ecology Research Institute, among others). Such collaboration will enable scientific knowledge to mutually complement each other and more efficiently generate more advanced research results.

(2) Promotion of Funded Research

Applying CRIEPI's fundamental research skills, we will proactively engage in research that meets the needs of the electric power industry, and will also receive government funding for research that will help to clarify issues related to the electric power industry. As an objective testing center, we will also facilitate the projects of the PD Center, which gives certification exams for experts of ultrasonic inspection working with nuclear power plant components, as well as the projects of the High Power Testing Laboratory, which performs short-circuit tests on electric power equipment.

(3) Systematic Introduction and Upgrades of Large-scale Research Facilities

We will systematically introduce large-scale research facilities to support the technological foundation of the electric power industry in order to meet the pressing needs of the electric power

industry and society and expand our research in new directions.

In fiscal 2011, we established the test facilities of insulation deterioration for aged XLPE power cable system. We will also introduce the Reactor Thermal Hydraulics Transient Test Facility, which simulates and visualizes transient change of coolant flow, and the Facility for Experiments on Advanced Carbonizing Gasification of Low-grade Resources, both of which are expected to be completed in fiscal 2012.

(4) Management and Application of Intellectual Property

We will strategically secure intellectual property related to our research results and disseminate information accurately to ensure its broad use. Specifically, we will digitize and microfilm research reports issued since CRIEPI's founding (to be completed in fiscal 2011) and expand our download services for disclosed materials. We will also strive to create high-value intellectual property by reinforcing the Center for Intellectual Property & Technology Licensing's function supporting patent searches and raising the quality of patent applications by utilizing invention consultation meetings. Moreover, we will make intellectual property more visible by assessing value with a focus on outcome and publishing intellectual property reports.

We will not only promote the use of the intellectual property we have built up to promptly resolve issues in the electric power industry, but will also strive to spread technology to businessmen working on the front lines of society through technology exchange courses and technology lectures. Moreover, we will actively introduce patents and software through forums and seminars hosted by technology transfer organizations and CRIEPI and external exhibits, and will encourage the transfer of technology to companies. Moreover, we will capitalize on our strengths as an academic research organization to participate in national and academic committees, thus contributing to the establishment of specifications, standards and technical standards for the energy and environment.

(5) Steady Implementation of Fundamental Activities

We will steadily carry out the following basic activities to promote a wide range of research activities and effectively disseminate information on research activities and results.

a. Collection of Literature, Materials and Statistics

We will secure and maintain a wide range of literature, materials and statistics and collect high-quality information by, for example, collecting information utilizing our position as an academic research institute and augmenting the collections at CRIEPI's various libraries. The compiled information will be used in research activities, and also given back to society at large through publications such as research reports.

b. Establishment and Use of Mainframe

We will examine detailed specification and select the precise model as we upgrade our mainframe in fiscal 2012 to cope with the increasing sophistication and complexity of our research. We will use this mainframe for general purposes in research activities, and it will help in generating superior research results. Moreover, we will actively obtain licenses for software, such as the mathematical simulation program that we developed, for wide use by electric power companies and manufacturers.

c. Issuance of Publications

We will gather research reports and public relations media in line with the progress made with our research issues and disclose them to society at large via our website.

Business Management

We will build a new framework for our research institute to prepare for the future, thus ensuring that we appropriately address the changing situation in the electric power industry and society and also continue to improve our own research skills. To do so, we will rebuild our research bases over the next few years, primarily in the Yokosuka region, and will steadily address the reformation of public interest corporation system, adjusting our organization's management system as necessary. This will establish a foundation for the future. We have outlined our plans in detail below.

(1) Reconstruction of Research Bases for New Research Developments

We will rebuild our research bases in Yokosuka, Abiko and Komae, clarifying their role in future research development and laying out the concept behind the facility as part of CRIEPI. Specifically, we will build the Center for Research on Energy Industry Technology by consolidating the Nuclear Technology Research Laboratory and System Engineering Research Laboratory in Komae with the new research institute in Yokosuka, which has the Electric Power Engineering Research Laboratory, Energy Engineering Research Laboratory and Material Science Research Laboratory. This will strengthen our ability to resolve issues corresponding to the value chain stretching from power generation, transmission, distribution and sales in the electric power industry. At the same time, the Abiko region, where the Civil Engineering Research Laboratory and Environmental Science Research Laboratory are located, will further expand as the base for natural and environmental science research. This is intended to improve our social infrastructure management capacity in addressing the risk of natural disasters, which could become more severe.

We will continue the work started in fiscal 2010 to develop infrastructure such as power sources in the Yokosuka region, and will also start on development procedures to establish a research facility on the newly acquired site. We will also prepare for the transfer by devising a transfer plan for large research facilities from the Komae region, such as the radiation safety facility, and a plan for the establishment of research laboratories to promote research exchanges exceeding researchers' individual fields.

Komae's Socio-economic Research Center will be transferred to the Otemachi region in early fiscal 2011 with the aim of encouraging further collaboration with a wide range of society, including the electric power industry, increasing opportunities for intellectual exchange and promptly meeting diverse needs.

(2) Focused Input of Financial Resources and Effective Use of Assets

We will strive to cut costs further by inspecting business activities and introducing greater efficiency and rationalization, and will also consider selling assets not expected to be used in the future as well as some sites in the Komae region. The fund raised in this way would be used to rebuild the research sites, including the facilities in the Yokosuka region. Moreover, we will effectively utilize our current research facilities, as well as eliminating unnecessary facilities and rigorously operating and managing our assets.

(3) Appropriate Response to Reformation of Public Interest Corporation system

In order to transfer to the status of a non-profit general foundation in fiscal 2012, we will steadily carry out the designated procedures, such as devising articles of incorporation (draft) and selecting

the first trustees for the period after the transition to our new status. We will also consider the establishment of regulations on executives as necessary

In addition to the full-time supervisors already appointed, we will further expand our internal control system by establishing a risk management and compliance system.

(4) Educating and Utilizing Personnel as the Key to Organization's Sustainable Development

We will establish measures that will enable researchers and administrative staff to perform their roles to their maximum ability and to maintain and enhance individuals' motivation and specialized skills as we prepare for the future expansion of our research institutes. Specifically, by strengthening the personal support functions by which the head office's human resource department directly draws upon employees' research interests and future goals and desires, the right employee can be assigned to the right position, thus enabling each individual to maximize his/her own potential.

Moreover, in addition to the current methods of securing researchers—full-time hiring, temporary employees (visiting researchers), transferred employees, and temporary staffing—we are studying and considering the adoption of new methods to flexibly secure the staff needed to meet the increasingly diverse research development going forward. This will also include a review of precedents at domestic and overseas research institutes.

(5) Promoting Information Transmission and Public Relations Activities to Raise CRIEPI's Value

We will continue to disseminate information such as our scientifically objective research results to a wide range of stakeholders after clarifying CRIEPI's position and point of view. At the same time, we will actively seek stakeholders' requests and views of CRIEPI and strive to reflect them appropriately in business operations.

Specifically, we will make policy and technology proposals at forums and symposiums hosted by CRIEPI, and disseminate information on research results in various public relations media and our website. At the same time, we will actively provide opportunities for the exchange of opinions with various levels of the electric power industry, hold social gatherings with the mass media and open our research laboratories to the general public, using these opportunities as a way to hear the views of our stakeholders.

Workforce

Although we anticipate an increase in the workforce in fiscal 2011 as a result of a rise in the number of Visiting Researchers and transferred researchers corresponding to the expansion of CRIEPI's research, as well as an increase in the number of reemployed employees with the part time reemployment system, employment will reach an equilibrium point of about 800 in the medium to long term as a matter of basic policy. Accordingly, we will not only further enhance the skills of our current workforce, but also continue to streamline office work.

The workforce in fiscal 2011 is as follows.

(Expected as of April 1, 2011)

Item	Number (people)	Percentage distribution (%)
1. Research	740 Including 35 Visiting Researchers	88.1 (100.0)
[Breakdown]		
(1) Electricity	121	16.3
(2) Civil Engineering and Construction	93	12.6
(3) Mechanical	96	13.0
(4) Chemistry	74	10.0
(5) Biology	62	8.4
(6) Nuclear Engineering	48	6.5
(7) Environmental Science	46	6.2
(8) Information and Communication	40	5.4
(9) Socio-economics	46	6.2
(10) Research Support and Management	114	15.4
2. Office work	100	11.9
Total	840	100

Statement of Budget

Budget Compilation

The budget for CRIEPI operations was reduced to 33,910 million yen in fiscal 2011, down 390 million yen over the previous fiscal year. The main points are as follows.

1. Operating Activities

- (1) Revenue from ordinary benefits increased 1,430 million yen over the previous fiscal year to 28,800 million yen.
- (2) Business revenue stood at 2,520 million yen, down 980 million yen over the previous fiscal year's budget.
 - Revenue from funded research is 1,800 million yen, down 200 million yen over the previous fiscal year's budget, as a result of an expected decrease in nationally funded research.
 - Other business revenue, including revenue from joint research, decreased 780 million yen over the previous fiscal year's budget to 720 million yen.
- (3) Other revenue was the same as the previous fiscal year's budget, at 110 million yen.
- (4) Business activity expenditures were up 810 million yen over the previous fiscal year's budget to 26,010 million yen.
 - Business expenditures were up 700 million yen over the previous fiscal year's budget to 24,250 million yen as a result of spending to steadily generate research results and increased obligations for social insurance premium.
 - Management expenditures amounted to 1,760 million yen, up 110 million yen compared to the previous fiscal year's budget, as a result of higher retirement payments and other factors.

2. Investing Activities

- (1) Revenue from investing activities is 2,140 million yen, including 1,200 million yen from the liquidation of special assets reserved for the acquisition of a research facility to carry out experiments on high-grade carbonizing gasification of low-grade resources and 830 million yen from the sale of public welfare assets.
- (2) Expenditures on investing activities included a 5,800 million yen investment in facilities such as a transient reactor test facility and a facility for experiments on high-grade carbonizing gasification of low-grade resources to ensure research competitiveness, as well as 2,100 million yen put into reserves for infrastructure development in the Yokosuka area.

3. Financing Activities

There were no revenues or expenditures for financing activities.

Budget

The fiscal 2011 budget, compiled based on the above, is as follows.

Fiscal 2011 Budget for Revenues and Expenditures

From April 1, 2011 through March 31, 2012

(Unit: Million yen)

	Budget	Revised budget to previous year	Up and down (△down)	Remarks
I. Revenue and expenditure in business activity				
1. Business activity income				
(1)Base property operation income	-	-	-	
(2)Benefit income				
Current benefit income	28,800	27,370	1,430	
(3)Business income	2,520	3,500	△980	
Funded research business income	(1,800)	(2,000)	(△200)	
Other business income	(720)	(1,500)	(△780)	
(4)Other income	110	110	-	
Business activity income total	31,430	30,980	450	
2. Business activity expenditure				
(1)Business expenditure				
Personnel expenditure	24,250	23,550	700	
Payment of expense, payment of expense	(10,020)	(9,720)	(300)	
(2)Management charge expenditure				
Personnel expenditure	(14,230)	(13,830)	(400)	
Payment of expense, payment of expense	1,760	1,650	110	
Business activity expenditure total	(980)	(880)	(100)	
Difference between revenue and expenditure in business activity	(780)	(770)	(10)	
Business activity expenditure total	26,010	25,200	810	
Difference between revenue and expenditure in business activity	5,420	5,780	△360	
II. Revenue and expenditure in investing activity				
1. Investing activity income				
(1) Special asset virement income				
Special asset virement income to acquire research facilities	1,200	1,550	△350	
(2)Fixed asset acquiring expenditure	830	980	△150	
(3)Long-term advance payment diversion expenditure	110	230	△120	
Investment activity income total	2,140	2,760	620	
2. Investing activity expenditure, Investing activity expenditure total				
(1)Special asset acquiring expenditure				
Special asset acquiring expenditure to acquire research facilities	2,100	2,600	△500	
(2)Fixed asset acquiring expenditure	5,800	6,500	△700	
Investment activity total	7,900	9,100	△1,200	
Difference between revenue and Expenditure in investing activity	△5,760	△6,340	580	
III. Revenue and expenditure in financial activity				
1. Financial activity income				
2. Financial activity expenditure				
Difference between revenue and Expenditure in financial activity	-	-	-	
Difference between revenue and Expenditure in the current period	-	-	-	
Difference between revenue and Expenditure in the previous balance brought forward	△340	△560	220	
Difference between revenue and Expenditure of balance carried forward	340	900	△560	
	-	340	△340	

- Note:
1. The borrowing limit was 200 million yen.
 2. Liabilities will amount to 4,500 million yen in fiscal 2012 and 600 million yen in fiscal 2013.