(1) Basic Factors for Project Implementation

■ Project outline and background of project planning

The purpose of this project is to reduce the greenhouse gas emissions from the combustion of petro-diesel fuel by replacing some portion of the petro-diesel fuel used in the transportation sector with bio-diesel fuel (hereafter abbreviated as BDF). The BDF we use is made from soybean oil in a BDF production plant located in southern part of the state of Minas Gerais, Brazil.

Brazil is the world's second largest producer of soybeans and produces 50 million tons of soybeans annually. Sumitomo Corporation and Petrobras, the largest petroleum company in Brazil, are planning to construct BDF production facilities in the vicinity of Uberlandia, southern Minas Gerais, Brazil. The facilities will produce 100 thousand tons of BDF annually (300 tons/day) from the plentiful soybeans. The BDF production plant is planned to be constructed near a soybeans depot in a suburb of Uberlandia located approximately 250 km south of the capital Brasilia.

Alkali catalyst method, which is one of the established technologies, is adopted to produce BDF.

The BDF produced in the BDF production plant will be added to petro-diesel fuel in a Petrobras' oil refinery in São Paulo (600 km from the BDF production plant), and the blended product is sold as B2 diesel fuel. The B2 diesel fuel will be supplied to the consumer public via gas stations.

When the project is implemented, the produced BDF is used as an alternative fuel to the petro-diesel fuel consumed the transportation sector in Brazil, and the consumption of petro-diesel fuel is reduced. It follows that we can also expect CO_2 emissions reduction.

■ Host country profile

This section describes the environments surrounding soybeans, soybean oil, and BDF, which deeply relate to this project.

Environment surrounding soybeans and soybean oil

(a) Soybeans Production

The world total production of soybeans is estimated as just less than 200 million tons, of which 90 percent is produced by four countries: United States, Brazil, Argentina, and China. Soybeans are widely cultivated in the temperate and subarctic zones, but certain countries make up a substantial portion of the production.

According to an announcement from the U.S. Department of Agriculture (USDA), because Brazil Real has risen 20 percent against US over the last year and because the production price of soybeans has declined significantly, it is predicted that the soybean acreage in Brazil in 2006 will fall below that of the last year for the first time in the past seven years; however, at the same time, the total production is estimated to be 58.5 million tons, which largely surpass the last year, due to increase in unit crop yields.

(b) Global Production of Vegetable Oil

The most produced vegetable oil in the world is soybean oil, followed by palm oil. The world's total production of vegetable oil is approximately 100 million tons, of which more than half consists of soybean oil and palm oil. The third most produced vegetable oil is rapeseed oil, but the production amount is only about half of that of palm oil.

The world's vegetable oil market is dominated by soybean oil and palm oil, and those two oils are completely different in characteristics. Soybeans are produced in broad terraces such as in United

States and Brazil. Soybeans have versatility that they are internationally distributed both in the form of unprocessed food materials and in the form of processed food such as soybean oil and soybean meal.

(1,000 tons/year)

Soybean oil	Palm oil	Rapeseed oil	Sunflower oil	Peanut oil	Cottonseed oil	Copra oil	Others	Total
29,748	25,033	13,326	7,611	5,299	4,178	3,106	8,512	96,813
30.7	25.8	13.8	7.9	5.5	4.3	3.2	8.8	100.0

Environment surrounding BDF

By the end of 2005, 15 facilities for BDF production have been constructed, having total capacity of 156 thousands kl/year. However, only 8 out of 15 have been approved by ANP, and only 4 out of them have actually produced BDF. Only a few percent of the total capacity is utilized. We can say that they are in the stage of test operation rather than commercial operation. (According to a survey performed by ANP, only 169.6 kiloliter of BDF in total was produced by four facilities in 2005 (March - October).)

By the end of 2006, some of the current 15 facilities will have been enhanced and new 11 facilities will have been constructed. These 26 facilities in total will have the capacity of 816 thousands kl/year, which supplies enough BDF for B2 diesel fuel of which use is legislated in 2008. However, because rise in the costs of BDF production plants and their incidental facilities are expected from the recent rapid rise in steel price, there is concern whether the BDF production plants are constructed as planned.

(ANP: Agência Nacional do Petróleo (National Agency of Petroleum))

BDF procurement by ANP (at auction)

For the two years (2006 - 2007) before 2008 when a law for BDF goes into effect, the Brazilian government is going to procure BDF at auctions held every six months.

All the distributors who sell petro-diesel fuel in Brazil are obliged to attend the auction. The BDF producers are not obliged to attend the auction, but are required to have the official seals authorized by Ministério do Desenvolvimento Agrária (Ministry of Agriculture Development) if they want to attend the auction.

On 24 November 2005, an auction was held to procure BDF for the first half of 2006.

The auction results are as follows:

66.5 thousands kiloliters of BDF was contracted, and the contract price range was 1.909 - 1.80 R$/liter, which was a little higher than the current selling price of diesel oil (1.79 R$/liter).

■ CDM/JI related policies and circumstances such as the criteria for CDM/JI approval and DNA establishment of the host country

Based on an Executive Order issued in July 1999, Interministerial Commission on Global Climate Change, which consists of 10 ministries and agencies, has been established. The committee members are as follows:

Chairman: Minister of Science and Technology
Vice-chairman: Minister of Environment
Committee schedule: Every two month

Committee Members (10 ministries and agencies):

- Ministry of Agriculture, Livestock and Supply
- Ministry of Mines and Energy
- Ministry of Development, Industry and Trade
- Ministry of Foreign Relations
- Ministry of Planning, Budget and Management
- Civil House of the Republic's Presidency
- Ministry of Transportation
- Ministry of Environment
- Ministry of Cities
- Ministry of Science and Technology

Eligibility criteria for CDM

The documents to be submitted to the committee and the conditions to be met are as follows:

Documents:

- PDD
- Description of how the project assists Brazil to achieve sustainable development

  The document must contain the following contents:

  (1) Contribution to local environmental sustainability
  (2) Contribution to labor conditions development and net employment creation
  (3) Contribution to income distribution
  (4) Contribution to capacity building and technological development
  (5) Contribution to regional integration and sectoral relationship
- Validation Report by Designated Operational Entity
- Formal Commitment to inform distribution of CER (Certified Emission Reduction) units to project participants in each verification
- Documents confirming compliance with labor and environmental Brazilian legislation in force, whenever necessary
- Invitation to following Stakeholders mandatory:

  Municipality and Municipal Representatives, State and Local Environment Agencies, Brazilian Forum of NGO's and Social Movements, Community Associations, and Public Ministry

Designated Operational Entity for project validation and verification/certification must be accredited by the Executive Board of the CDM and be fully established on the Brazilian territory, and must have capacity to assure compliance with pertinent requirements of the Brazilian legislation.

Final decision on approval is made within 60 days after the first ordinary meeting of the Commission subsequent to the submission of documents.

In addition, non-disclosure of confidential information is protected by the Brazilian legislation.

■ **How the project assist sustainable development of and technology transfer to the host country**

In approving the CDM projects, Brazil's Designated National Authority (DNA) evaluates the project candidates based on the following eight guidelines and sets the priority among them.

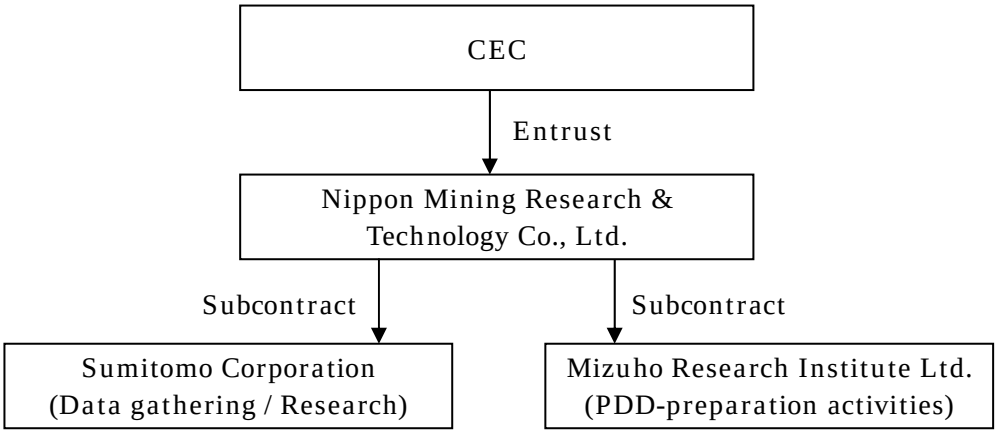
(1) Contribution to climate change mitigation
(2) Contribution to sustainability of regional environment
(3) Contribution to employment creation
(4) Influence on income distribution
(5) Contribution to sustainability of balance of payments
(6) Contribution to sustainable economic growth
(7) Cost-effectiveness
(8) Contribution to technical independence

The project will bring about not only reducing the GHG emissions but also the following effects which contribute to the sustainable growth that Brazil's DNA attaches importance to.

- Besides CO_2, reducing SOx (sulfur oxide) emissions by the use of petro-diesel fuel will lead to the mitigation of urban air pollution from automobile emissions.
- A new production facility will necessitate new workers, such as facility operators, maintenance operators, and administrative staffs. These workers will be recruited within the local labour market. It means employment will be created thanks to the new facility.
- The amount of the import of light oil will decrease by using the domestic energy source, and it will contribute to the energy security.
- BDF production technology by alkali catalyst method has been used in Brazil only by foreign companies so far. Taking it into consideration, the penetration of this technology will lead to technical independence by domestic enterprises.

■ **Structure for carrying out study (in Japan, Brazil, etc.)**

The purpose of this study was to study the feasibility of BDF production in Brazil and to assess its viability as a CDM project. The study was performed as follows: GEC has entrusted the study to Nippon Mining Research & Technology Co., Ltd. Some tasks in the study were subcontracted to Sumitomo Corporation and Mizuho Research Institute Ltd.



(2) Project Planning

■ Details of the project

Planned construction site for BDF production plant

The BDF production plant is planned to be constructed in Uberlandia located approximately 250 km south of the capital Brasilia, or approximately 600 km north of São Paulo.

The BDF production plant is planned to be constructed near a soybeans warehouse, which began operation two years ago, in a suburb of Uberlandia. A soybean oil extraction plant is planned to be constructed in the premise of the warehouse.

Technology adopted

Alkali catalyst method, which is one of the established technologies, is adopted to produce BDF.

Design criteria

The plant will produce 100 thousands tons of BDF from soybean oil per year. The plant will be operated around the clock 333 days per year. The required site area for the plant construction is estimated to be about 10,000 m^2 (100 m x 100 m).

BDF (product) standard

The BDF standard in Brazil was enacted in 2004 by ANP. The standard is made using EU Standard (EN14214) and American Standard (ASTM D6751). The standard is marked by the fact that it has many reporting items that do not have limit values. According to ANP, those values are defined when enough data are accumulated.

Project implementation schedule

The outline of the schedule is as follows: establishment of the operating company in 2006, construction and installation of the plant in 2007, and commercial operation from the third quarter of 2008.

■ Setting project boundary baseline and proving additionality

Based on the assumption that "Generalized baseline methodology for transportation Bio-Fuel production project with Life-Cycle Assessment" (NM129 -> AM00xx) is approved as a baseline methodology, the methodology is applied to the project.

Verification of applicability conditions

This section describes whether the project meets the applicability conditions (a) through (g) of the methodology.

(a) The project practitioner procures soybean oil from soybean oil extraction plants currently in operation.

(b) The project does not contain plantation process of the raw material of BDF. Therefore, fertilizers used in plantation process are disregarded.

(c) There is no limitation on the use of fossil fuels in Brazil. Although a regulation that requires petro-diesel fuel to contain 2 percent of BDF will be introduced in Brazil from 2008, the regulation can be excluded from this condition because, as confirmed in 16th CDM committee,

the regulation was adopted after The Marrakech Accords.

(d) In Brazil, several measures have been taken to promote the use of BDF. However, the BDF production in Brazil is still in its infancy, and BDF does not have large share in the related markets. The current BDF production capacity is only about 1 percent of the demand for petro-diesel fuel (40 million kl/yr).

(e) The BDF production in Brazil is still in its infancy.

(f) The BDF production company is to conclude a contract with Petrobras to prevent BDF from being used for the purposes other than transportation and from being exported. In addition, every year after the project is started, we monitor and ensure that all BDF has been blended with transportation fuels and never has been exported to Annex I countries, and will present the evidence.

(g) Brazil depends on imports for petro-diesel fuel; however, there is no limitation on the import and consumption of petro-diesel fuel in Brazil. It is expected that there will be no limitations on petro-diesel fuel consumption.

As shown above, this project meets the applicability conditions for the methodology. The methodology is appropriate to the project.

Identification of baseline scenario and proof of additionality

As indicated in "Generalized baseline methodology for transportation Bio-Fuel production project with Life-Cycle Assessment," we divided the project's life-cycle into the three stages shown below. We reviewed each stage, and arrived at the conclusion that the baseline scenario option "continuation of the existing practice" met all the applicability conditions on all the stages. To put it plainly, the baseline scenario is the state that the automobiles using BDF in the project scenario is using petro-fuels. Therefore, the emission from the baseline scenario is expected to be larger than that from the project scenario, and this proves the additionality of the project.

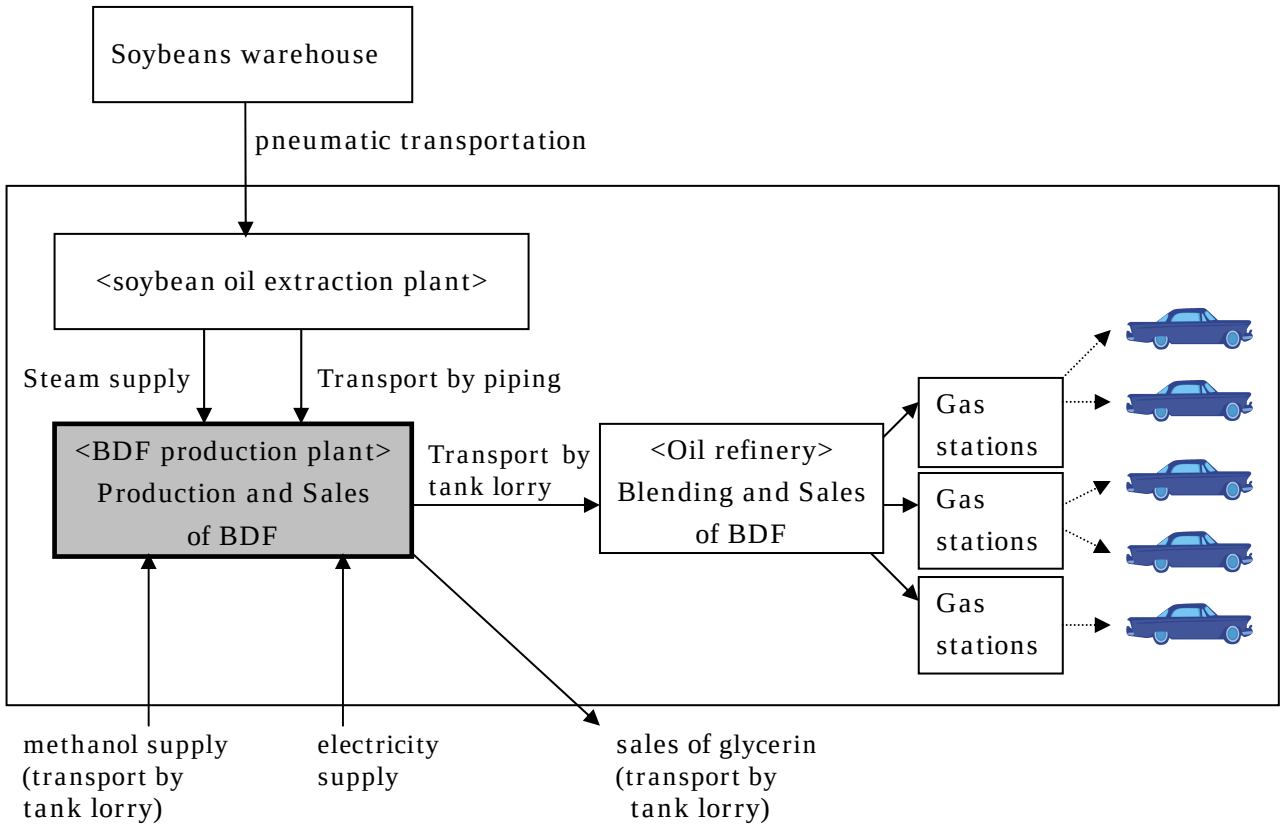
Stage 1: Biomass feedstock supply (Soybean production)

Stage 2: Bio-fuel production (Bio-diesel fuel production from soybean oil)

Stage 3: Bio-fuel consumption (Bio-diesel fuel consumption)

Setting project boundary

The project boundary is set as follows:



■ GHG emissions reduction and leakage by project implementation

Baseline emissions

The baseline emission BEy within the boundary in a certain year y is given by the following formula:

$BE_y = BF_y \times COEF^{FF} \times (1 + \delta)$

BF_y: BDF sold or utilized in a certain year [GJ/yr]

$= BF^{vol}_y \times Density_y \times HV_y$

BF^{vol}_y: BF_y volume [m^3/yr]

$Density_y$: BDF density [ton/m^3]

HV_y: BDF calorific value [GJ/ton]

$COEF^{FF}$: $LCACO_2$ equivalent emission factor of petro-diesel fuel which BDF substitutes [tCO_2/GJ]

δ: Correction factor of the difference in the average mileage among fuels per GJ

$= [L_{biofuel}/L_{fossil}] - 1$

L_{fossil}: The average mileage of petro-diesel fuel which will be substituted by BDF [m/MJ]

$L_{biofuel}$: The average mileage of BDF [m/MJ]

The baseline emissions in case of producing 100,000[t/yr] of BDF is estimated as follows.

BF_y = 100,000 x 10^3 [kg/yr] x 9,730[kcal/kg-BDF] x 20.2[tC/TJ] x 43.33[TJ/10^3ton] x 44/12[tCO_2/tC] ÷ 10,950[kcal/kg-diesel] x 1.0 = **2.85 x 10^5 [tCO_2/yr]**

Project emissions

The project emissions PE_y within the project boundary in a certain year y are given by the following formula:

$PE_y = FF^{BFP}{}_{oil,\,y} \times COEF^{FF}{}_{oil} + BF^{mass}{}_y \times COEF^{FS} + PE^{Transp1}{}_y$

$FF^{BFP}{}_{oil,\,y}$: Heavy oil consumption for steam supply to BDF production plant [kl/yr]

$COEF^{FF}{}_{oil}$: LCA CO_2 emission factor of heavy oil [tCO_2/kl]

$BF^{mass}{}_y$: BDF sold or utilized in a certain year [t-BDF/yr]

$COEF^{FS}$: CO_2 emission factor of the non-bio feedstock (methanol) contained in BDF [tCO_2/t-BDF]

$PE^{Transp1}{}_y$: Transportation-related CO_2 emissions from the BDF production plant to the fuel supply facility [tCO_2/yr]

$ML^{Transp1}{}_{,y}$: Transportation distance from the BDF production plant to the fuel supply facility [km]

$COEF^{Transp1}$: CO_2 emission coefficient for BDF transportation (by diesel truck) [$kgCO_2$/km]

The project emissions in case of producing 100,000 [t/yr] of BDF is as follows.

PE_y = 2,900[kl/yr] x 3.1[tCO_2/kl]+0+10^5[t/yr]/15[t] x 1,200[km] x 0.77[$kgCO_2$/km]

= **15,150 [tCO_2/yr]**

Leakage

Leakage L_y, as the net emission change in a certain year y, is given by the following formula:

$L_y = EL_y \times COEF^{EL}{}_y/(1\text{-}Loss_y)$

EL_y: Electricity used for acceptance of soybean oil and production of BDF in the BDF production plant [MWh/yr]

$COEF^{EL}{}_y$: CO_2 emission factor of the used electricity [tCO_2/MWh]

$Loss_y$: Transmission loss of the grid [-]

Electricity used for acceptance of soybean oil and production of BDF in BDF production plant is estimated 4,988 [MWh/yr].

CO_2 emission factor of the used electricity, $COEF^{EL}{}_y$, is calculated using "Average OM method" referred in ACM0002. The result of calculating is 0.160 [tCO_2/MWh].

Therefore, in case of producing 100,000 [t/yr] of BDF, CO_2 emissions from electricity used for acceptance of soybean oil and production of BDF in the BDF production plant are estimated as follows. Transmission loss is assumed 5 percent.

$L_y = EL_y \times COEF^{EL}{}_y/(1\text{-}Loss_y)$

= 4,988[MWh/yr] x 0.160 [tCO_2/MWh] /(1-0.05) = **840[tCO_2/yr]**

Since this amount is smaller than 1 percent of the baseline emissions, this emission source can be considered to be negligible.

GHG reduction by project implementation

Emission reductions ER_y in case of producing 100,000[t/yr] of BDF is given by the following formula.

$ER_y = BE_y\text{-}PE_y\text{-}L_y$

=2.85 x 10^5 [tCO_2/yr]-15,150[tCO_2/yr]-0[tCO_2/yr]

=**2.70 x 10^5 [tCO_2/yr]**

■ Monitoring plan

The project is monitored using the monitoring methodology. B, P, and L represent the parameters required to calculate baseline emissions, project emissions, and leakage respectively.

ID number	Data variable	Source of data	Data unit	Measured(m), calculated(c), stimated(e)	Recording frequency	Proportion of data to be monitored	How will the data be achieved?
B1. BF_y	BDF sold or utilized in a certain year		GJ/yr	m	daily	100%	electronic
B2. BF^{vol}_y	BF_y volume	Volumeter	m^3/yr	m	daily	100%	electronic
B3. $Density_y$	BDF density	Densimeter	ton/m^3	m	monthly	Sampling	electronic
B4. HV_y	BDF calorific value		GJ/ton	m	monthly	Sampling	electronic
B5. $COEF^{FF}$	LCACO_2 equivalent emission factor of the petro-diesel fuel which the BDF substitutes	BDF purchaser, statistical data, scientific literature	tCO_2/GJ	c	Once in the beginning of the crediting period	100%	electronic
B6. $BF_{[produced]}{}^{VOL}{}_y$	BDF production	Volumeter	m^3	c	daily	100%	electronic
P1. $FF^{BFP}{}_{oil,y}$	Heavy oil consumption for steam supply to the BDF production plant	Flowmeter	kl	m	daily	100%	electronic
P2. $COEF^{FF}{}_{oil}$	LCA CO_2 emission factor of heavy oil	BDF purchaser, statistical data	tCO_2/kl	c	Once in the beginning of the crediting period	100%	electronic
P3. $BF^{mass}y$	BDF sold or utilized in a certain year	Weight scale	t	m	daily	100%	electronic
P4. $COEF^{FS}$	CO_2 emission factor of the non-bio feedstock (methanol) contained in BDF		tCO_2/t-BDF	c	Once at the time of drafting PDD	100%	electronic
P5. $PE^{Transp1}{}_y$	Transportation related CO_2 emissions from BDF production plant to fuel supply facility		tCO_2/yr	c	monthly	100%	electronic
P6. $ML^{Transp1}{}_{,y}$	Transportation distance from BDF production plant to the fuel supply facility	Forwarder's receipts or odometer records	km	m	Monthly (measure at a time of transportation)	100%	electronic
P7. $COEF^{TR}{}_{mode\ 1}$	CO_2 emission coefficient for transportation of the BDF (by diesel truck)	Statistical data	$kgCO_2$/km	c	Once at the time of drafting PDD	100%	electronic
L1. EL_y	Electricity used for acceptance of soybean oil and production of BDF in the BDF production plant	Wattmeter	Mwh	m	monthly	100%	electronic
L2. $COEF^{EL}{}_y$	CO_2 emission factor of the used electricity	Statistical data	tCO_2/MWh	c/e	yearly	100%	electronic
L3. $Loss_y$	Transmission loss of the grid	Statistical data	-	c/e	yearly	100%	electronic

■ Environmental impact / Other indirect impacts

Environmental impact

To construct BDF production plants, we have to go through procedures required by the laws of Minas Gerais where the plants are to be installed.

1) Environmental licenses approved by the provincial government
   Assessment and document submission are required in each stage.
   (1) Preliminary license (project proposal)
   (2) Installation license
   (3) Operation license

2) EIA (Environmental Impact Assessment) implementation
   Environmental impact is classified into seven stages according to the potential pollution of plants.
   1 - 3 stages: EIA is not required. 4 - 7 stages: EIA is required.
   It is assumed that BDF production is classified to stage 4, which requires a simple EIA.

(a) Glycerin produced as a by-product (31.5t/day) is sent to chemical facilities in São Paulo, and is utilized as raw material of soap and shampoo. Therefore, environmental impact by the by-product is assumed to be small.

(b) Wastewater from the BDF production facilities (100t/day) is discharged after it is treated in the water treatment facility to meet the wastewater quality standard and to lessen environmental impact.

In addition, the heat source for the BDF production plant is the steam generated in the boiler facilities in the soybean oil extraction plant. By selecting a fuel that meets the environmental standard in the boiler facilities of the soybean oil extraction plant, we lessen the environmental impact.

Other indirect impacts

(a) Job creation

The project creates jobs in raw material production and product transportation as well as in the newly-built plant. Consequently, revitalizations of and economic effects in the city and state can be expected.

(b) Improvement of the Balance of Payment

The produced BDF will replace petro-diesel fuel that is currently imported from overseas. This will contribute the improvement of the Balance of Payment in Brazil.

■ Stakeholders' comment

The procurement of raw material (soybean oil) in this project meets the agriculture promotion program of the government. In addition, establishing a new company and constructing and operating BDF production plant will create jobs. Furthermore, utilizing the produced BDF as a blend component with petro-diesel fuel exactly meets the renewable energy promotion policy of the government. Therefore, we can expect active cooperation from the host country.

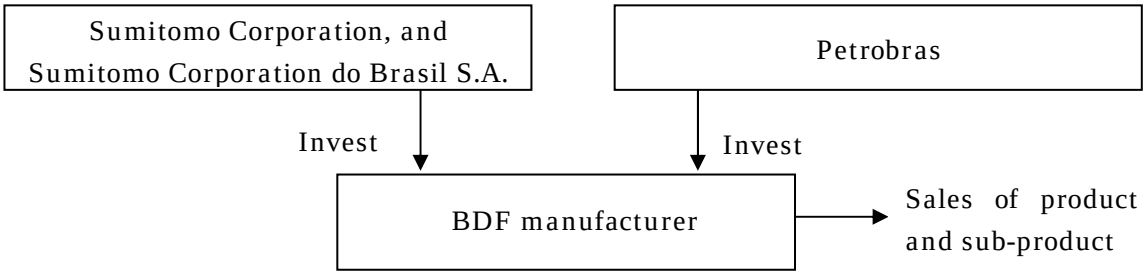
In the process of coming up with the details of the project plan, we are going to have meetings with stakeholders including the Uberlandia city authorities.

(3) Issues and tasks for project implementation

■ Implementation structure for project implementation (in Japan, Brazil, etc.)

We establish an operating company in Brazil, which holds and operates the BDF production plant.

The operating company is funded by Petrobras, Sumitomo Corporation, and Sumitomo Corporation do Brasil S.A.



In promoting the project, the companies play roles as follows:

Petrobras:

Purchases all the produced BDF, blends B2 (B5 from year 2013) diesel oil in oil refineries or oil depots, and sells it at the affiliated gas stations.

Sumitomo Corporation / Sumitomo Corporation do Brazil:

Handle the proper procurement of the raw materials (soybean oil, methanol, etc.).

■ Cash planning for project implementation

This project requires about 25 million US$. Petrobras, Sumitomo Corporation, and Sumitomo Corporation do Brazil invest in the project as follows:

Petrobras:	13 million US$
Sumitomo Corporation:	10 million US$
Sumitomo Corporation do Brazil:	2 million US$

Each company invests own fund in the project, and the use of public funds is not planned.

■ Cost-effectiveness

Investment analysis

Preconditions

(1) The initial investment, including acquisition of land, BDF production plant and the incidental facilities, is 25 million US$.

(2) The initial investment is paid out of the companies' own funds only.

(3) BDF production is estimated to be 50,000t/yr in the first year at 50% capacity, and is estimated to be 100,000t/yr at 100% capacity in the second and later years.

(4) The cost for producing 100,000t/yr of BDF is 65.33 million US$.

(5) BDF sales price

A long-term sales contract will be signed with Petrobras.

The BDF sales price is decided based on the market price of diesel oil. Incentives are provided to Petrobras so that Petrobras can assume an obligation to purchase all the BDF.

The base price is calculated as follows: $P_{BDF}=(P_{diesel}/1.0925) \times 0.80/2.20$

P_{BDF}: BDF sales price [U$/liter]

P_{diesel}: Market price of diesel oil [R$/liter]

P_{diesel}/1.0925: Excluding tax (PIS/CONFINS: 9.25%) from the market price of diesel oil

0.80: Excluding Petrobras' 10% sales margins and 10% incentive from the market price of diesel oil

2.20: 1US$ = 2.20 R$

Currently, P_{diesel} = 1.80 R$/liter. Thus,

P_{BDF}=(1.80/1.0925) x 0.80/2.20

= 0.599 [US$/liter] = 0.680 [US$/kg] (BDF density: 0.88 [kg/liter])

(6) Purchase price of soybean oil 0.492[US$/liter] (average price from 2003 through 2005)
The total of the average FOB price in past three years at Port of Paranagua and 10% margin is assumed to be the next year's purchase price of soybean oil. (Port of Paranagua: An embarkation port for such as soybeans and soybean oil, matching the capacity of Port of Santos)

(7) Glycerin sales price 0.200 US$/kg
The price is from a predicted price in 2008 in an Oleoline's Glycerin Market Report.

(8) Corporation tax: 34%

(9) Straight-line depreciation method over 10 years is used, and the salvage value is 0%.

(10) Exchange rate is 1 US$ = 2.2 R$ (Brazil Real)

Result of the analysis

From the above preconditions, the IRR for 10 years of crediting period is calculated as 8.2% (without CER) or 12.6% (with CER 5US$/t CO_2), being below the profitable level (15%). If the credit price is 8.0 US$/t- CO_2, the IRR becomes 15%.

Cost-effectiveness per 1 ton of CO_2 emissions reduction

This project reduces 2,565,000 [tCO_2eq] over 10 years crediting period. If the cost-effectiveness of the project is evaluated based on the project cost per 1 ton of CO_2 emissions reduction, the following value is obtained:

25,000,000[US$]/2,565,000 [$tCO_2eq$] = 9.75[US$/tCO_2eq]

= 1,170[JPY/tCO_2eq] (Exchange rate 120JPY/US$)

■ Expectations and challenges toward commercialization

Procurement of raw material (soybean oil)

It is assumed that the BDF production plant are constructed near the soybeans warehouse and soybean oil extraction plant in view of a stable supply of the raw material, soybean oil.

(a) The soybean warehouse has been in operation since 2003, and the suppliers and routes have been established.

(b) The soybean oil extraction plant is planned to be constructed next to the soybean warehouse by around the end of 2006. Although the details have been designed, the construction has not yet been started. We are concerned about the delay.

(c) If the construction of the soybean oil extraction plant is suspended or cancelled, we have to find a new place appropriate for raw material (soybean oil) procurement.

Marketing

(a) Petrobras, which sells B2 diesel oil, purchases all the produced BDF.
In addition, it is advantageous for BDF sales to have the BDF production plant near São Paulo, which is one of the major markets.

(b) The by-product glycerin is to be sold in Brazil. In the event of collapse of glycerin price, we will consider using the glycerin as boiler fuel. If this is the case, we have to resolve the problem of the damages on combustion chamber caused by the salt in the glycerin.

Consultations with Petrobras

We have had consultations with Petrobras on several items, and have conducted our own studies. The addition of BDF becomes mandatory in 2008. It is time for us to determine the feasibility of the BDF project We are going to improve the profitability of the project by having in-depth consultations with Petrobras, and would like to bring about the project realization.