

Feasibility Studies with the Aim of Developing a Bilateral Offset
Credit Mechanism FY2011

Studies for Project Development and Organization

Program organization research on CO2 reduction
in the Asian region logistic network –
Establishment of traffic control system and
development of MRV capable cloud application in
the host country

New Energy and Industrial Technology Development Organization (NEDO)
Nippon Express Co., Ltd.
Fujitsu Ltd.
Nittsu Research Institute and Consulting, Inc.

Dissemination and Promotion of Global Warming Countermeasures Technologies, 2011
Country: Asian region Category: Transportation

**“Program organization research on CO2 reduction in the Asian region logistic network
-Establishment of traffic control system and development of MRV capable cloud application in the host
country”**

Project Proponent: Nippon Express Group & Fujitsu LTD

Purpose for survey in 2011

Pervious year's study made clear the effectiveness of Digital Tachograph/Cloud computing system for reducing CO2 emission. This study can prove that our J-VER (Japan Verified Emission Reduction) methodology, as the MRV methodology, is also suitable to calculate/asses CO2 emission effectiveness targeting bilateral offset crediting mechanism .

Considering current situation for local truck operators who are not likely have enough resources, some kind of support programs should be prepared for promotion and realization on CO2 emission in the transport sector.

Results and Issues of the Study in 2010

Result

- Cloud computing and digital tachograph is effective for CO₂ emission reduction in Asian countries.
- Developing calculation methodology of CO₂ emission reduction is necessary under bilateral offset mechanism (M in MRV).

Issues

- Developing supportive applications being installed to cloud server under the bilateral offset mechanism.
- Promoting cloud computing and digital tachograph by streamlining institutional scheme.
- Designing and developing financial scheme.

Proposal in this 2011

Develop and test-run MRV Application for Bilateral Offset Credit Mechanism (BOCM)

Design Framework of Institutional Scheme on Eco-Driving and Operating Management

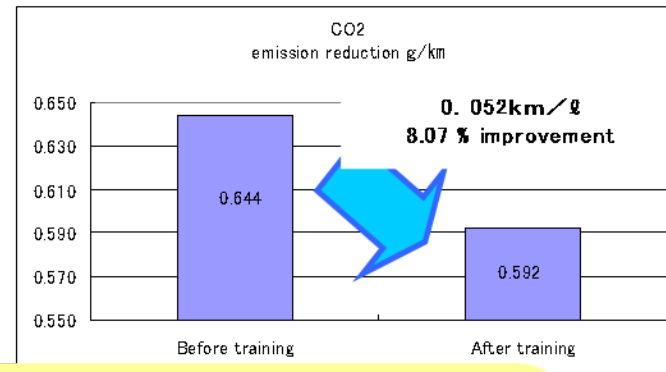
Design Framework of Financial Scheme for Promoting Digital Tachograph and Cloud Computing

“Develop and test-run MRV Application for BOCM

**Table: CO2 emission reduction
(All vehicle)**



**Table: CO2 emission reduction
(only for well-educated drivers))**



Result

CO2 emission has reduced from 0.641g/km to 0.610 g/km by 4.84% reduction, which is equal to 5.15% of fuel consumption reduction.

Taking a look at detailed respective vehicle's performances, only 70% has succeeded in CO2 emission reduction. Their CO2 reduction improvement ratio is calculated at 8.07%, representing that 8.52% fuel consumption reduction. This implies that the importance of continuous and thoroughly training

conclusion:

- DT installation is effective to manage CO2 emission by making reduction process “visible”.
- Training is important, in particular, that for low performance drivers is critical.

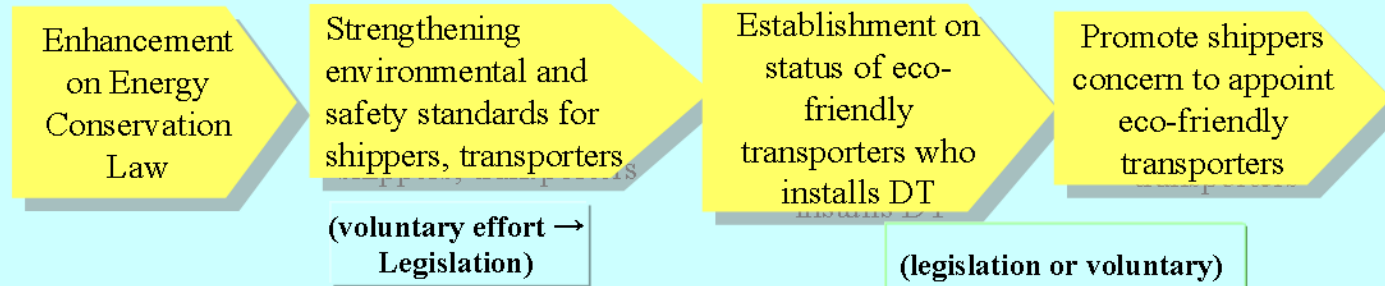
Design Framework of Institutional Scheme on Eco-Driving and Operating Management

Result

- Vietnam already adopted energy saving law (No.51/2001/Qh10), however, any numerical goals or definite targets are not determined yet. Along with the significance of this law, it is appropriate to enhance truck operator's obligation
- Since DT installation leads to achieving safety and eco-driving, some kind of "certification" would be an incentive for business activity for transporters.
- Taking a look at Japanese experience, the eco-driving and safety driving have been promoting in accordance with collaboration of legal legislation and non-legal/voluntary institutions.

Conclusion

(Image of practical scenario for future institutional development)



Design Framework of Financial Scheme for Promoting Digital Tachograph and Cloud Computing

Result

PIRR of Base Case, which is based on the simulation result in test run, is around 25%, which indicates certain profitability in the project. Additionally if Education Fixation Rate is 70%, there is a room for the improvement of PIRR up to 47.9% by perfecting implementation of Eco-driving training.

Table: Evaluated Result of PIRR (Project Internal Rate of Return)

		Maximum Improvement Rate of Fuel Mileage				
		10.0%	7.5%	5.0%	4.0%	3.4%
Education Fixation Rate	100%	69.8%	47.9%	23.3%	10.0%	0.0%
	90%	52.4%	41.0%	17.2%		
	80%	52.4%	33.8%	10.4%		
	70%	43.3%	26.1%	2.5%		
	60%	33.8%	17.2%	-6.6%		
	50%	23.3%	6.6%	-18.4%		

PIRR < 0%
 PIRR < 10%
 Base Case(the Case based on the simulation result of the test run described as 3.1.

Maximum Improvement Rate of Fuel Mileage: Improvement Rate of Fuel Mileage when Eco-driving training is firmly implemented to truck drivers.

** Education Fixation Rate: Fixation Rate of Eco-driving training to truck drivers. If Education Fixation Rate is 100%, truck drivers can accomplish Maximum Improvement Rate of Fuel Mileage.

Result

The general life time of DTs is about 7 years, so if all debt is repaid within 7 years from installing DTs, truck operators may find profitability to participate to the project. In Base Case, DRP is around 5 years, so there is profitability in Base Case .

Table: Evaluated Result of DRP (Debt Repayment Period)

		Maximum Improvement Rate of Fuel Mileage		
		10.0%	7.5%	5.0%
Education Fixation Rate	100%	2yrs	3yrs	5yrs
	90%	3yrs	3yrs	6yrs
	80%	3yrs	4yrs	7yrs
	70%	3yrs	5yrs	9yrs
	60%	4yrs	6yrs	12yrs
	50%	5yrs	8yrs	14yrs

1st year's cash flow < 0

Base Case(the Case based on the simulation result in NIPPON EXPRESS (SOUTH CHINA) CO., LTD.)

conclusion,:

Test run results points out RIRR and DRP is feasible when fuel consumption improvement achieves around 5 %. More feasibility depends on credit purchasing unit price, improvement of Education Fixation Rate, reduction of the initial expense (grandt or subsidiary), or better borrowing condition.