

Discounting and environmental valuation in cba environmental sciences essay

[Environment](#), [Ecology](#)



This REMT undertaking supported by GEF grants chiefly consists of two constituents ; Renewable Energy Power Generation - set uping the policy and regulative models and beef uping the institutional capacity for renewable energy development, 2) Commercial Solar Water Heating (CSWH) - supplying proficient aid and edifice industrial capableness for CSWH systems and services [1] .

The undertaking appraisal study examined its feasibleness by non merely incremental cost analysis of the undertaking but besides the economic and fiscal analysis of possible renewable energy undertakings which the REMT undertaking would promote to implement.

I have focussed on cost benefit analysis of the undertaking and looked at whether or non the estimated price reduction rate and rating of nonmarket merchandises and services are decently determined during the undertaking assessment. Particularly, I have reviewed the assorted methods of environmental rating and different consequences on economic value of CO2 emanation decrease, which is considered as a major benefit of the REMT undertaking.

Background to the Undertaking

In general, South Africa has a well-developed power sector, with a entire 42GW installed capacity and 244, 607 GWh electricity production accounting for about 45 % of sum produced power in Africa in 2004. As a consequence of heavy dependance on coal for energy ingestion, South Africa remains the top 10 manufacturers of GHG emanations in the universe. As such, the Government published its White Paper on Renewable Energy taking for

renewable energy development and set a mark of 10, 000GWh of renewable energy part by 2013 [1, 2] .

The REMT undertaking aims to take the barriers of renewable energy engineering's development by backing up the Government in setting up the policy and regulative models. In addition, the undertaking provides proficient aid and capacity edifice for renewable energy development. The GEF besides finances some portion of advisers ' services and goods for CSWH systems installing under the public presentation grants.

Ultimately the undertaking is expected to excite important private sector investing in renewable energy sector and to assist accomplishing the Government 's mark [1, 3] . Furthermore, it contributes to extenuate nursery gas emanation in the line with the GEF 's planetary environmental nonsubjective [4] by replacing the conventional power works with renewable energy.

Analysis for Project Appraisal

Incremental Cost Analysis

The intent of the GEF is to supply supportive support for incremental costs to increase the planetary environmental benefits. As such the incremental cost and the planetary environment benefit demand to be explicitly analysed during the undertaking assessment. The undertaking appraisal study defined value of CO₂ emanation avoided by CSWH systems as a Global Environment Benefits of the undertaking. The table-1 below summarises incremental cost analysis in this study. [1]

Table 1: Summary of Incremental Cost Analysis for REMT undertaking

- Baseline
- Alternate
- Incremental
- Domestic Benefit
- Job Creation, Private Net income
- Job Creation, Private Net income
- None
- Global Environment Benefits
- Slow advancement towards overall renewable energy mark ; 15 old ages cumulative value of CO2 emanations avoided by CSWH systems (0. 15 M metric tons)
- Accelerated advancement towards overall renewable energy mark ; 15 old ages cumulative value of CO2 emanation avoided by CSWH systems (1. 15 M metric tons)

Cost (US \$)

- 2. 3 M (Government)
- 2. 5 M (Private Sector)
- 8. 3 M (Government, GEF)
- 9. 0 M (Private Sector)
- 6. 0 M (GEF)
- 6. 5 M (Private Sector)

Economic and Financial Analysis

Given catalytic map of the proficient aid, out economic and fiscal analysis was carried out non merely for CSWH undertaking but besides a sample of possible undertakings which this TA undertaking could promote the private sector to put in [1]. The societal and economic impact classes, measurement indicant and other values which were used for the analysis are outlined below [2].

Table 2: Summary of Economic and Financial Analysis for REMT undertaking

- Undertaking Component
- Renewable Energy Power Generation
- CSWH
- Cost
- Capital Cost
- Market monetary value (2004) estimated by proficient expert
- Capital Cost
- Market monetary value (2004) estimated by proficient expert
- O & A ; M Cost
- O & A ; M Cost
- Benefit
- Avoided Coevals Cost
- Long run fringy cost (LRMC)
- Cost avoided by exchanging (Saved Electricity)
- Eskom 's Duty
- Avoided nursery gas emanation

- Carbon emanation decreases (CERs) monetary value
- Avoided nursery gas emanation
- Carbon emanation decreases (CERs) monetary value
- Discount Rate

Evaluation of the Project Appraisal Document

Discount Rate

The price reduction rate was non explicitly stated in the appraisal study, but harmonizing to its economic and fiscal analysis due diligence study [2] , it is found that the price reduction rate of 10 % was applied for the economic analysis for the possible undertakings (renewable energy power coevals) .

The studies justified the determination of the price reduction rate of 10 % saying the same price reduction rate was used for recent electricity sector surveies from National Electricity Regulator (NER) . On the other manus, in the economic analysis of CSWH system shown in Annex 9, it revealed that the price reduction rate of 0 % was applied without any justification.

Therefore, it is necessary to reexamine how to find the price reduction rate on the REMT undertaking which has the long term planetary environmental benefit from CO₂ emanation decrease.

In general, the pick of appropriate societal price reduction rate in the cost benefit analysis is a cardinal issue for finding the present value of any long footings societal impacts that occur in the hereafter [5] . The ADB economic and research section working paper provinces that:

“ Putting the societal price reduction rate excessively high could prevent many socially desirable public undertakings from being undertaken, while putting it excessively low hazards doing a batch of economically inefficient investments. Further, a comparatively high societal price reduction rate favours undertakings with benefits happening at earlier day of the months ; while a comparatively low societal price reduction rate favors undertakings with benefits happening at subsequently day of the month. ”
[6]

In peculiar utilizing high price reduction rate on undertakings referring the environmental issues such as climate alterations and planetary heating has been criticized. There are a assortment of statements on finding the proper price reduction rate. Some has argued that the price reduction rate demands to be lowered in general to stress future environment effects. The usage of a lower price reduction rate individually on certain environmental impact and worsening price reduction rates has been besides suggested [7] .

Using a fanciful price reduction rate (10-12 %) for the World Bank funded undertakings [8] , the price reduction rate of 10 % used in the REMT undertaking seems proper. However, as the REMT is the planetary climate alteration related undertaking which has intergenerational environmental benefits and costs, it seems more sensible to use the lower rate. Even though legion reviews on the Stern Review exist, it is found that the societal rate of discount of 1.4 % was applied for dismissing planetary climate alteration impact [6] , which is significantly lower than the price reduction rate for the REMT undertaking.

In add-on, harmonizing to the manual for ciphering GHG benefit of GEF undertaking, the larger uncertainnesss for GEF undertaking compared to CDM undertaking compromises the quality of a GHG impact appraisal for undertaking assessment by using no price reduction rate on future GHG emanation decreases [9] . This could be another ground why the lower price reduction rate should be considered for the REMT undertaking.

Environmental Valuation (CO2 Emission Reduction)

One of the advantages to utilize cost benefit analysis is that a policy or undertaking can be assessed by quantifying the value of all societal and economic effect in pecuniary footings. It besides means predicting and monetising all impacts are significantly of import for the accurate analysis. However, in pattern valuing in pecuniary footings is hard and combative particularly for environmental impacts. [10]

The REMT undertaking identified one of the benefits as the value of avoided nursery gas emanation from conventional coevals displaced by renewable coevals. In the economic analysis, the value was calculated by the market value of gas emanation decrease (CERs, \$ 3. 75/tonne CO₂) mentioning to the old Prototype Carbon Fund Durban Landfill Gas Project [1] . Of class, there are the big scopes of the estimated economic value of emanation decrease depending on different premise by each survey [12] . However, it seems hard to state that a simple market monetary value of CERs to the full reflects the environmental and societal value of reduced gas emanation for the analysis. Furthermore, the estimated value of CO₂ emanation decrease

seems undervalued being considered as the planetary benefit of the REMT undertaking.

Duong has categorised the monetary value of C as five definitions ; 'the expected extenuation of climate-change harm ' , 'the cost of cut downing CO2 emanations ' , 'the societal cost of C ' , 'the politically negotiated value ' and 'CO2 market monetary values ' . And it stated that the monetary value of different definition well varies. [12] Among the above definitions, in order to monetise the entire societal and environmental benefits from reduced emanation accurately, it could be more sensible to utilize the societal cost of C, an estimated pecuniary value to society of environmental CO2 emanation impact [13] , alternatively of the market monetary value.

In general, chief attacks for environmental rating are known as 'stated penchant methods ' , 'revealed penchant methods ' and 'benefits transfer ' [14] . In add-on, Koomey introduced two rating methods particularly for emanation decrease. 'Direct harm appraisal ' monetise the amendss such as human wellness and environmental effects definitively related to emanation of a pollutant. This method is highly complicated and hard. On the other manus, 'cost of suspension ' uses the cost of pollutioncontrols imposed by regulative determinations as a placeholder of the outwardness costs. But rapid society 's penchants may ensue in misrepresentative suspension cost computations. [15]

In malice of recent progress in environmental rating methods, 'Benefits Transfer ' deducing the values from old surveies has been progressively

popular for policy assessment in footings of environmental rating, since it can be carried out faster and more cheaply than primary rating surveys [14] . There are several different attack of benefits transfer method, which have been introduced ; the first attack is reassigning original unit value from a 'study site ' to 'policy site ' and the 2nd attack is reassigning full WTP maps. Another method is a meta-analysis of bing rating surveys to find sensible value for a policy site [16] .

While the research on the societal cost of C has been conducted, Tol examined 211 estimations of the societal cost of C through the meta-analysis and concluded that a average value were \$ 120/ton of Carbon (\$ 33/tonne CO₂) for surveys between 1996 and 2001 and \$ 88/tonne of Carbon (\$ 24/tonne Cos) for surveys since 2001. [17] Even though the average value of Tol 's analysis (\$ 29/tonne CO₂) has been criticized, it seems clear that the value of \$ 3. 75/tonne CO₂ estimated in the REMT undertaking is non plenty to reflect the economic and societal impacts of CO₂ emanation decrease.

Decision

This essay has reviewed the societal price reduction rate and environmental rating used for the economic analysis of the REMT undertaking. These two factors are significantly critical to analyze and gauge net present value of the cost and benefit of the undertaking, which is considered as the chief standard to be applied in determination.

By reexamining the surveys on an appropriate price reduction rate and CO₂ emanation rating, despite ongoing arguments, it seems a more wise attack to use the lower price reduction rate and higher economic value of CO₂ emanation decrease for the REMT undertaking. This attack leads to the addition of economic and societal benefits of the undertaking and shows the determination to continue with the REMT undertaking was sensible overall. However, in footings of choice of subproject, different determination could be made based on this attack.

The undertaking appraisal study has clarified the ground for singling out CSWH among the possible options such as biomass, air current, small-scale hydro and landfill gas. But if the lower price reduction rate and higher economic value of decreased emanation was used, so during the undertaking planing stage, the REMT undertaking might displace other specific options which may hold more economic and societal benefits compared to CSWH.