

Value Analysis of Split AC

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Abstract- This approach is very creative to eliminate the unnecessary cost which add neither to the quality nor to the appearance of the product. It is one of the newer scientific aids to managerial decision-making. The necessary functions for the minimum cost without diminishing quality, reliability, performance and appearance are ensured by this disciplined approach. It is also systematic analysis that identifies and select the best value alternatives for designs, materials, processes and system. It comprises a group of techniques aimed at the systematic identification of unnecessary costs in a product or service and efficiently eliminating them without impairing its quality and efficiency.

Keywords- Value Engineering, creative phase

I. INTRODUCTION

‘Value’ is a word that is very often used by individuals without being clearly understood. Forget about common people. Even different departments of the same organisation have different opinions of the ‘value’ of the product that the company manufactures. The designer equates value with reliability; purchase people with price paid for them; production personnel with that of cost from the angle of manufacture; sales people with what customer is willing to pay. In the field of value investigation, value refers to economic value, which itself can be sub-divided into four types as cost value, exchange value, use value and esteem value.

Value analysis is an organised approach to identify unnecessary costs associated with any product, material, part, component, system or service by analysis of function and efficiently eliminating them without impairing the quality functional reliability or its capacity to give service. According to Society of American Value Engineers (SAVE) “Value analysis is the systematic application of recognised techniques which identify the function of a product or services establish a monetary value for the function and provide the necessary function reliability at that lowest overall cost.” “Value analysis is the study of the relationship of design, function and cost of any material or service with an object of reducing its cost through modification of design or material specifications, manufacture by more efficient process, changes in sources of supply, elimination or incorporation into another item.”

II. LITERATURE REVIEW

“Value Analysis” is the application of a set of techniques to an existing product with a view to improve its value. The method has logical foundation in its fundamental approach to cost reduction and profit improvement and in this objective approach, the VA techniques has to analyse the functional cost of an item and recommend a change. The phrase value analysis can be defined as a technique which examines the facts of a function and cost of a product in order to determine whether the cost can be reduced or altogether eliminated, while retaining all the features of performance and quality of a product or both. Therefore, logically, VA is an organised approach of exposing and eliminating unnecessary costs. Put alternatively, VA is a team approach to think functionally about a component as to “what it does” rather than “what it is”. A significant part of VA is a technique called Functional Analysis, where the product is broken down and reviewed as a number of assemblies. Here, the function is identified and defined for each product assembly. This approach is the real test of understanding problems under study. Value Analysis (VA) is concerned with existing products. It involves a current product being analysed and evaluated by a team, to reduce costs, improve product function or both. Value Analysis exercises use a plan which step-by-step, methodically evaluates the product in a range of areas. These include costs, function, alternative components and design aspects such as ease of manufacture and assembly. Costs are also assigned to each one. This is assisted by designing and viewing products as assemblies (or modules). As with VE, VA is a group activity that involves brainstorming improvements and alternatives to improve the value of the product, particular to the customer.

Objectives of Value Analysis:

- To use efficient and economical process.
- To simplify the product.
- To increase the utility of the product.
- To use cheaper and better material.
- To reduce the cost of the product.
- To improve the product design.
- To increase the profits.

Advantages of Value Analysis:

- The value analysis process often allows users to root out practices that have grown out of date and can be replaced with more modern approaches.
- A critical advantage to using value analysis is its potential for reducing costs, which is a benefit that permeates all advantages of the system.
- Value analysis can uncover design flaws that not only operate inefficiently but also create problems.
- Value analysis is oriented to weigh costs and the benefit to customers of a product or service.

III. APPLICATION OF VALUE ANALYSIS OF SPLIT AC

Background And Objective:

- Split-type Air Conditioners (Split ACs) are responsible for largest share of energy consumption and GHG in RAC in many countries worldwide.
- Barriers include decision maker's (policy, consumers) little knowledge about the energy and cost efficiency of split-type ACs.
- Objective of the study is to provide an overview of energy and cost efficiency, climate impact of split-type ACs in selected partner countries.
- The results and recommendations shall help policy makers to undertake informed decision making towards more efficient and climate-friendly split AC.



Fig. Split AC

- Analysis of over 1,460 split type AC units across 67 local and international brands in 9 GIZ Proklima partner countries in Africa, Latin America, Middle East and South East Asia.
- Assessment of commonalities and differences of split AC markets among countries.

- Analysis of relationship between energy efficiency and market prices, share of technology type (inverter/ fixed speed) and refrigerants used.
- Recommendations on improving Minimum Energy Performance Standards (MEPS) and transitioning to appliances with improved energy efficiency and low GWP refrigerants

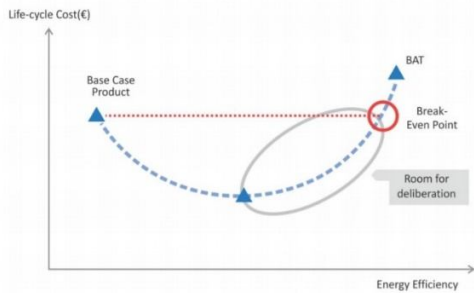
Methodology And Assumptions:

- Collection of split AC-related key data in electronic stores, brand stores and online shops in each country in order to calculate:
 - National average energy efficiency in relation to current MEPS regulation.
 - Life cycle costs of split AC.
 - Total Equivalent Warming Impact (TEWI).
- 2-3 capacity classes with the highest distribution of appliances were selected for each country.
- Energy efficiency is uniform.
- For the refrigerant emission analysis, the following assumptions are used:
 - Annual leakage rate (ALR) = 5%
 - End of life emissions (EOL) = 95 %
- Energy efficiency categorization:
 - Energy efficiency (EE) was categorized in the country analysis with lower (3.5).
 - EER 3.5 defines “no regret” level, as it is higher or at the same level of current MEPS and (average) LCC lower for all countries.
 - A MEPS of EER 3.5 has advantages for all countries and end consumers due to lower emissions and LCCs

Limitations:

- Data sample size varies from country to country.
- Data collection only during a defined period of four months.
- Appliances offered in selected consumers stores do not necessarily indicate the representative market share of a model (e.g. units sold in ‘B to B’ might contain additional models and different inverter /fix-speed ratio).
- Efficiency metrics were converted for inverter splits from SEER to EER to allow comparison

Cost Effectiveness of Split ACs:



- “Too cheap”: Appliances unit costs lower than 10% of LCC ◊ appliances with better EER will have strong impact on lowering LCC: Grenada, Philippines, Thailand and Indonesia.
- “Price matters”: Countries with lower LCC and unit price over 15% of LCC: Markets more sensitive to higher appliance prices ◊ Costa Rica, Colombia, Ghana and Iran.

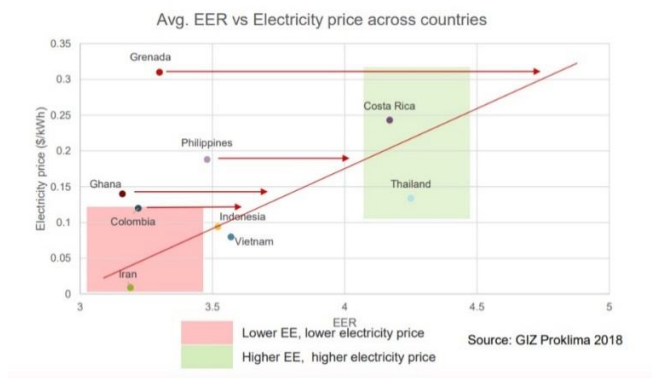
IV. CONCLUSION

In this paper we have successfully applied one particular aspect of value analysis in race car chassis. The chassis of the car made according to feasibility of the driver and reduction of cost and we tried to overcome all the flaws from previous year and fulfilled our objectives. Many brainstorming sessions were conducted to discuss the ideas proposed in this paper and we believe the ideas can be implemented so that the customer as well as the manufacturer will get optimum product without compromising on other qualities.

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Cross-country comparison: EER vs Electricity Price:



Cross-country comparison: LCC vs. Unit Price –

