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An Alternative Organic growth through Acquisitions Investigation on Wind Energy

Pedram Asef*[a], R. Bargallo Perpina[b], Bereket. T. Habte[c], A. Babaeian[d]

a, b Department of Electrical Engineering, Polytechnic University of Catalonia-BarcelonaTech, Comte d'Urgell, 187, Barcelona, CAT 08036 Spain

c Laboratory of Advanced Energy Systems, CAS Key Laboratory of Renewable Energy, Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences (CAS), Guangzhou 510640, China

d president of e plus smart company, #312-28 olive Ave- North York- Ontario/ M2N7E6, Canada

Abstract

In this paper, attention has been focused on continuous profitable growth which tends to the wind energy business worldwide, willing to go to consummate lengths in its pursuit with horizontal and vertical integration which bring speed, minimum risk to the development strategy at which enables experts to reach guaranteed growth. Organic growth through horizontal and vertical integration strategy in where Ansoff matrix was applied; a proposed management strategy through economic analysis verification has been shown and compared with typical organic strategy outcome. The return of investment with a lower rate of risk investment as objective of the work has been successfully achieved, in order to present a solution to following future challenge, considerable questions after recent Paris Climate Change Conference (PCCC) renowned as "how should EU manage such a big needed asset in order to build/ or buy possible renewable energy projects in the developing world countries?" as long as developed countries have been titled as notable share of greenhouses gases and "how should strong financial leadership make flawless scenarios for clean energy technologies?". Nonetheless, acceptable financial methodology will be addressed as major study of the paper for only EU grant funding action. Besides, all advantages and disadvantages of the proposed strategy will be discussed.

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Keywords: merges and acquisitions; value chain analysis; inorganic growth; organic growth; wind energy

* Corresponding author. Tel.: +346-5619-9466; fax: +0-000-000-0000 .
E-mail address: pedram.asef@estudiant.upc.edu; ramon.bargallo@upc.edu; bereketth@ms.giec.ac.cn; ali@eplussmart.ca

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1. Introduction

In the PCCC (Dec, 2015), according to the UN reports, global temperature was considered in contrast with late 19th century in which the global temperature has been risen by $0.9\,°C$, which means if only the number of coal power plant will increase that causes CO_2 more than 400%. Whereas, global recent investments and scenarios on wind energy (as dominant renewable energy), Table. I represents that global usage of wind energy is increasing very slightly in compare to Greenhouses gases applications [1][2].

Therefore, long-term agreement of the PCCC (published on December of 2015) as a first major overshoot has made a decision in terms of ambitious action before and after 2020. As a part of pre-2020 action, gathering up to a hundred billion dollars per year from participated countries till 2020 in order to provide a primary capital to make clean energy technologies such as wind energy in EU member countries[2-3].

As theoretical background of merger and acquisition (M&A), and diversification (interestingly both literatures explicitly, or implicitly, draw on ideas that are central to the resource based view (henceforth RBV (Resource Based View)) – see [11]). The M&A literature, overwhelmingly focusing on samples of large publicly companies, shows the financial returns to M&A activity are, on average, negligible at best (see [9]). Similarly, the diversification literature, overwhelmingly drawing on studies of publicly companies, suggests that there is a curvilinear relationship between diversification and financial performance. The performance of the firm improves for increasing levels of diversification, up to a relatively modest level, and then tails off (see [10], for a review and a meta analysis). While these two bodies of literature are impressive, we know them as being tangentially related, but not gist, to our research on growth[4].

Table I: Global Wind energy scenarios road map

Global		2007	2015	2020	2030	2040	2050
Reference scenario	Electricity generation (TW/a)	173	677	1,009	1,536	2,034	2,516
	Installed capacity(GW)	95	293	417	595	739	883
Energy [r]evolution scenario	Electricity generation (TW/a)	173	941	2,168	4,539	6,674	8,474
	Installed capacity(GW)	95	407	878	1,733	2,409	2,943
advanced energy [r]evolution scenario	Electricity generation (TW/a)	173	1,166	2,849	5,872	8,481	10,84
	Installed capacity(GW)	95	494	1,140	2,241	3,054	3,754

In this paper, an organic growth through horizontal and vertical integration strategy will be carried out in purpose of comprehensive management of EU grant funding; proposed methods such as Synergies and RBV to assessing how successful applied M&A activities are, to the strategy. Attention has been focused on EU grant funding action based on future investment plan. Based on published reports, the EU will take better advantage of the fact that its research and innovation framework program horizon 2020 is fully open to third world countries' participation and provides financial support to them. The EU will promote awareness of its commitment to invest under this program for climate change related actions which assumes as EU grant funding for further investments in the strategy. A proportion of which allows broad international collaboration to bring climate technologies to the markets, to educate scientists and entrepreneurs, and contributes to climate diplomacy goals [2-3].

In the following section, the proposed strategy will be introduced and in the last section, a result and discussion will represent effect of this study in future business developing based on wind energy.

2. Growth Strategy Based On Wind Energy

This study proposed a coming growth strategy because of its valuable common and uncommon advantages to face our demanding functions in compare to typical strategies as listed below:

1. Less Risky
2. Stronger management and better effective planning
3. Maintains existing culture and management styles
4. Improving supply chain coordination
5. Higher control over inputs and the whole value chain
6. Better advantage of changes in the marketplace
7. More unlimited resources for growing the business

On the other hand, uncommon advantages (rely on horizontal and vertical integration, synergies, and so on) can be given as:

1. Reducing transportation costs
2. Participating upstream or downstream profit margins
3. Leading to expansion of core competencies
4. Opportunity to realize synergies between the merged companies
5. Speedy growing
6. Identifying the firm's potential key resources
7. Evaluatingwhetherthese resources fulfill the following criteria
8. Protecting resources that possess these evaluations, which can improve organizational performance
9. Emplacing EU technical wind companies into the business cycle

In terms of organic algorithm, Ansoff matrix was applied to the strategy, which was made up four blocks such as asset replication, new market and technology, new customers (public/private), and diversification. As a key advantage of diversification role, growth and risk spreading and diversification and shareholder value. Besides, higher levels of diversification are not incompatible with high performance, nor do they necessarily imply that firms will suffer lower performance levels.

In the other side, inorganic algorithm with M&A strategy was applied for making successfully completing M&A deals, hiring retain capable and experienced M&A advisors are strongly proposed. In where having a capable and reliable EU technical wind energy supervision of the wind farm projects including M&A deals (Siemens, Wind Power, Vestas, and etc), fully open to third world countries' participation and provides financial/ technical supports to third world countries to operate the projects successfully [3]. There are some certain gains rely on mentioned participation between an EU financial/ technical supervisor and third countries' corporation which bring easier control and better monitor of the outgoing EU grant funding (as loan, subsidy, and etc), successful worldwide M&A deals, reliable technical wind farm operation under an EU corporation supervision, and making EU technical corporations stronger as a part of the funded projects.

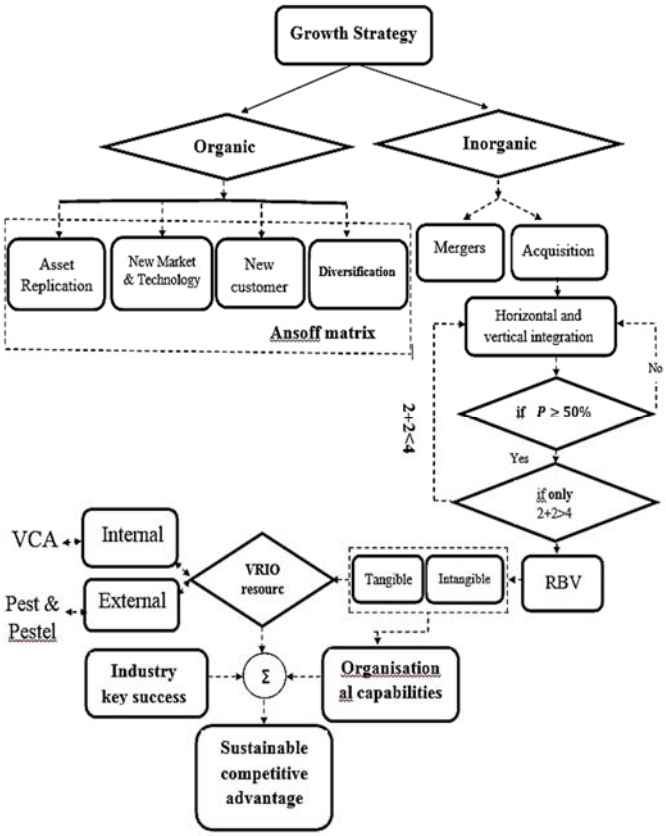
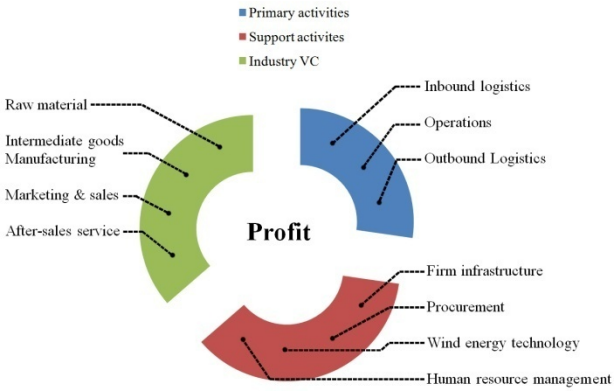


Fig. 1. The proposed growth strategy scheme

After that, modeled synergies and RBV will assess whole M&A deals. In where RBV framework is a model that calls resources (Tangible and Intangible assets based on heterogeneous and immobile assumptions) as key into superior firm performance [6]. If a resource exhibits value rarity imitability organization (VRIO) attributes, the resource enables the firm to gain and sustain competitive advantage.

With regarding to VRIO resources, we employed two different type of tools to realize the sources of competitive advantage firms that are using tools to analyzing their external by PEST analysis (to analyzing of the political, economic, social and technological factors in the external environment of an organization, which can influence its activities and performance) in where Pestel model involves the collection and portrayal of information about external factors[7]; internal through Value Chain analysis (VCA) environments. VCA was carried out to process where a firm identifies its primary and support activities that add value to its final product and then analyze these activities to decrease costs or increase differentiation. Hereby, by looking into internal activities, the analysis reveals where a firm's competitive advantages or disadvantages are. The firm that faces off through differentiation advantage will try to perform its activities better than competitors would do. Whether that competes via cost advantage, it will try to perform internal activities at lower costs than competitors would do [8]. When a third world countries' supplier is capable of producing goods and energy at lower costs than the market price or to provide superior generated energy, its apparatus and equipments, which earns profits. According to above statements, below profit schematic can be presented as Fig. 2.

Fig. 2. Profit schematic of the firm's VC as a part of a larger industry VC



As cash inflow and outflow are discounted back to its present value, thus, the net present value (NPV) has been calculated for both strategies as follows:

$$NPV(i,N) = \sum_{t=0}^{N} \frac{R_t}{(1+i)^t} \quad (1)$$

In where t, i, N, and R_t are the time of the cash flow, the discount rate, the total number of periods, and the net cash flow, respectively.

The internal rate return (IRR) will be calculated as given:

$$IRR = r_a + \frac{NPV_a}{NPV_a - NPV_b}(r_b - r_a) \quad (2)$$

where r_a, r_b are lower and higher discount rate chosen, respectively. NPV_a stands for NPV at r_a, and NPV_b is the NPV at r_b.

Also, the Du pont analysis was carried out based on the return on assets (ROA) ratio, and the return on equity (ROE) ratio as

$$ROA = \frac{Net\ income}{Sales} \times \frac{sales}{Total\ assets} = \frac{Net\ income}{Total\ assets} \quad (3)$$

$$ROE = \frac{Net\ income}{Equity} = \frac{Net\ income}{Pretax\ income} \times \frac{Pretax\ income}{EBIT} \times \frac{EBIT}{Sales} \times \frac{Sales}{assets} \times \frac{Assets}{Equity} \quad (4)$$

in where net income is the income after taxes, Equity is shareholders' equity, as well as, *EBIT* is earnings before interest and taxes.

The return on investment can be expressed as below

$$ROI = \frac{(revenue - cost\ of\ investment)}{cost\ of\ investment} \quad (5)$$

To valuing the project, discounted cash flow (DCF) analysis has been accounted, in where, from the future value (FV) formula to calculating the time value of money and compounding returns, the following equation is derived

$$DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \cdots + \frac{CF_n}{(1+r)^n} \quad (6)$$

$$FV = DCF \times (1+r)^n \quad (7)$$

Where *FV is* the nominal value of a cash flow amount in a future period, *r* is the interest rate or discount rate,

which reflects the cost of tying up capital and may also allow for the risk that the payment may not be received in full [12]. *n* is the time in years before the future cash flow occurs. Thus, the first year, we have $1250 \times (1+5)^1 = 7500\ (euros)$, and in the 20th year as$1250 \times (1+5)^{20} = 4.57 \times 10^{18}\ (euros)$.

Therefore, multiple cash flows in multiple time periods are discounted as

$$DPV = \sum_{t=0}^{N} \frac{FV_t}{(1+r)^t} \quad (8)$$

Also, for continuous cash flows, can be re-expressed through integration by

$$DPV = \int_0^T FV(t).e^{\lambda t} dt \quad (9)$$

where$\lambda = \log(1+r)$.

3. Results and Discussion

In this section validity of the discussed strategy based on financial calculations will be given in order to evaluate the proposed strategy, given following technical and financial data based on two below assumptions:

1. The subsidized part of the investment cost is not depreciated
2. Salvage value added to the net cash flow of the last year (20th year)

Fig. 3 represents the DPV analysis through a comparison among the future net value and the NPV in 8% and 15%, in addition, the trend of each bar has individually shown.

As consequence of Fig. 4, the proposed strategy has offered time as function of return of assets (ROI) in which return on assets is one of the elements that derived into financial Furthermore, Table III as funding data of this case study assumes that total amount of capital employed is made up three sections, own capital in which developing countries should analysis through employing Du Pont model, in where ROI hits over 7%. For example, in this case study the total assets will be earned in the 5th year by proposed strategy. Nevertheless, typical strategy is able to achieve that value in 6th year.

Additionally, growth of the net cash flow of the proposed strategy has been seen by substantial overtaking year to year in compare to typical strategy in this study. By provide (40%) and the rest of that amount will be inject by EU grant funding (60%) via subsidies and loans.

The installment loan is a kind of loan which is repaid in periodic installments based on annual payments that include principal and interest, the calculation was reported via Table IV. Also, the amortization is a distribution of loan repayments into the multiple cash flow installments, as determined via an amortization schedule. Moreover, amortization is chiefly used in loan repayments and in sinking funds. Payments are divided into equal amounts for the duration of the loan, making it the simplest repayment model, the calculation of the loan equal amortization was given through Table V [13]. Fig. 5 represents the two used approaches with a comparison, in where, the Moreover, Table VI as data and results of CBA. In this case study, the NPV (benefit and social) were calculated in thousand of Euros. After that, IRR-Social and B/C calculations with proposed strategy has found better position than typical strategy with 58.7%, and 6.1%, respectively.

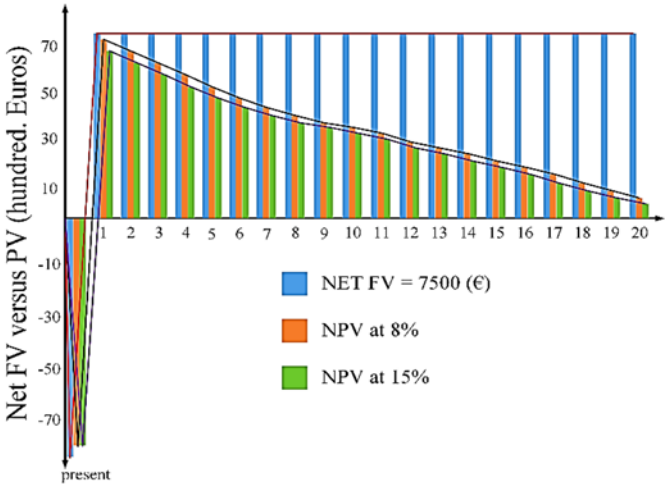


Fig. 3. The net future value versus the NPV

Table II: Technical and financial data of calculation

Data	Unit	Value
Wind farm capacity	MW	100
Investment cost	€/MW	1250
Load factor		0.27
Operational cost	% Inv.Cost	3.0
Salvage value	% Inv.Cost	15
Tax rate	%	25
Depreciation rate	%	8
Interest rate	%	7
Feed-in-Tariff	€/MWh	87.85
Lifetime	years	20
Discount rate	%	10
Other costs	% Sales	3.0
Levelized cost of wind energy	€/MWh	0.067
Total generated electricity	MWh	236520

Table III Funding data

Funding data	Unit	Value
Total investment cost	Th. €	125000.00
Own capital	%	40
Subsidy (EU)	%	30
Loan (EU)	%	30
Depreciation period	years	12.50

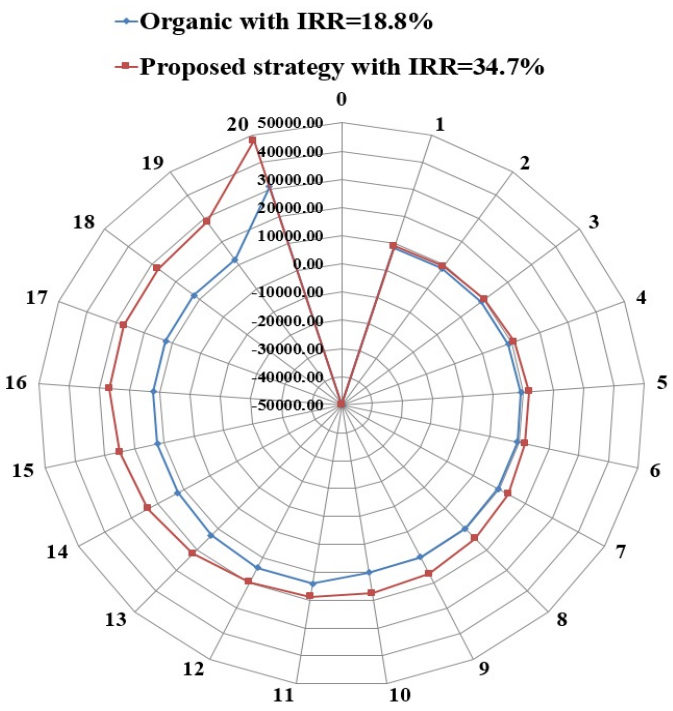


Fig. 4. Net cash flow based on organic and proposed strategy

Table IV Loan equal installment

Year	Loan	Interest	Installment	Amortization
0	37500.00			
1	33750.00	2625.00	3750.00	6375.00
2	30000.00	2362.50	3750.00	6112.50
3	26250.00	2100.00	3750.00	5850.00
4	22500.00	1837.50	3750.00	5587.50
5	18750.00	1575.00	3750.00	5325.00
6	15000.00	1312.50	3750.00	5062.50
7	11250.00	1050.00	3750.00	4800.00
8	7500.00	787.50	3750.00	4537.50
9	3750.00	525.00	3750.00	4275.00
10	0E+00	262.50	3750.00	4012.50

Table V Loan equal amortization

Year	Loan	Interest	Installment	Amortization
0	37500.00			
1	34785.84	2625.00	2714.16	5339.16
2	31881.70	2435.01	2904.15	5339.16
3	28774.26	2231.72	3107.44	5339.16
4	25449.30	2014.20	3324.96	5339.16
5	21891.60	1781.45	3557.71	5339.16
6	18084.85	1532.41	3806.74	5339.16
7	14011.63	1265.94	4073.22	5339.16
8	9653.29	980.81	4358.34	5339.16
9	4989.87	675.73	4663.43	5339.16
10	0.00	349.29	4989.87	5339.16

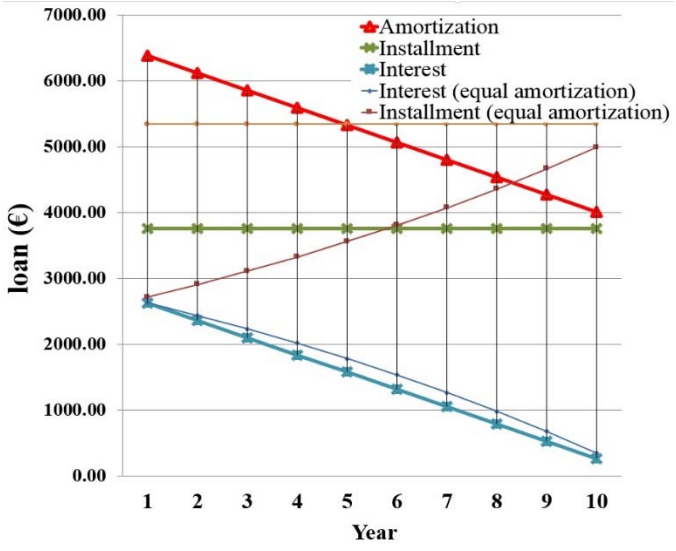


Fig. 5. The loan stream comparison

Table VI Cost-benefit analysis (CBA) and its results

Data	Unit	Value
Social value of electricity	€/MWh	120.00
Cost of fuel saved (i.e natural gas)	€/MWh	48.10
External benefit due to avoided emissions	€/MWh	13.93
External cost of wind power plant	€/MWh	1.00
Social discount rate	%	5
NPV-Benefit	Th. €	486863.86

NPV-Social	Th. €	361864
IRR-Social (typical strategy)	%	31.1
IRR-Social (proposed strategy)	%	58.7
B/C (typical strategy)		3.9
B/C (proposed strategy)		6.1

4. Conclusion

In this paper, attention was focused on a new management strategy coupled with economic analysis in order to verify the proposed strategy as an alternative organic growth through acquisitions investigation in wind energy based on the budget from the participated countries in the Paris climate change conference (Dec, 2015). Moreover, the proposed strategy can be adopted into other sections of the power generation.

Regarding to the outcomes of the study, economic analysis part of paper was successfully verified through use various formulas such as RBV, VRIO, and corresponding to the VCA, and pest and pestel calculations to evaluate inorganic part of management strategy.

In addition, the study has provided all calculation data such as funding, loan, technical case study, and cost-benefit analysis data in the results and discussion section. Regarding to the given data, the proposed strategy has been achieved the objectives of the investment, in where, the proposed strategy will reach the investment value a year earlier by the 5th year with lower risk.

The commercial and environmental issues of the study have been highly noted to reduce the CO2 emissions as a part of green power generation projects.

5. Acknowledgement

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