Green Hotelling
A Feasibility Study in the Hellenic Island of Skyros

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Knowing to manage the territory, protect the environment, evaluate the cultural heritage

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Ecological Consciousness

Environment - Friendly Solutions

“Green” Entrepreneurship

“Green” Development

“Green” Tourism

* Construction Sector
* Bioclimatic Architecture
* Operational Framework
* Co-existence with Local Features
* High Environmental Necessity
* Economy Environmental Adjustment
* Few Cons/ces to Local Environment
* Tourism vs Environment
* “Eco-tourists”
* “Green” Hotelling
Inquiry and Implementation of Environment-Friendly Solutions is now the Challenge to the Construction Sector.

“A special strategic tool recently implemented by the United Nations.

A comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System, Governments, and Major Groups in every area in which human impacts on the environment.

Adopted by more than 178 Governments at the U.N. Conference on Environment & Development (UNCED), Rio de Janeiro, Brazil, 3-14 June 1992.
**Operational Framework:**

- **Location of the Business**: needing protection, prudent management of resources and designation of its natural and cultural identity, ensuring a brand awareness.
- **Identity of the Business**: built through economical, technical, legal, political, cultural and ecological processes, forming its special features and novelties.
- **Quality of the Business**: strongly connected to adhering to the terms and criteria of sustainable development and to certifying its co-existence with the environment.
- **Competitiveness of the Business**: depending on the two previous factors.
- **Financial Resources**: looked for through subsidy programs, usually in the public sector (for infrastructures), needing special management planning and expenses allocation.

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**“GREEN” ENTREPRENEURSHIP (4/4)**

The best way to achieve energy-efficient constructions is by reconsidering the way buildings are designed until today.

- **Selecting structural materials considering their thermal, toxic and visual qualities**
- **Study the built-up environment and the problems it is introducing**
- **Designing of Buildings**

**Environmental Constructions**

Reduction of energy consumption achieved by simple methods & techniques:
- Bioclimatic Design
- Energy-efficient Systems & Technologies
“GREEN” DEVELOPMENT

- Passive House
- Sustainable Building
- “Green” Building

BIOCLIMATIC ARCHITECTURE

Takes into account the topography, climate, ground relief, orientation, solar radiation, wind, temperature, humidity, rain etc in order to:

- restrain their consequences to the shell of the building
- exploit them to achieve conditions of thermal ease & healthy living inside
- achieve cleaner environment with less emissions and energy saving through restraining the use of conventional power resources

It is essentially an effort to commit to natural and renewable energy sources

Bioclimatic Architecture is best achieved using a combination of the above

Passive Systems
- Passive Solar Heating Systems
- Passive Natural Cooling Systems & Techniques
- Natural Ventilation Systems & Techniques

Energetic Systems
- Minimum or Zero Emissions Local Energy Systems (Using renewable sources to produce thermal & mechanical energy)

Renewable Energy Sources (R.E.S.)
- Minimize Energy Consumption Effects to the Environment
“GREEN” TOURISM (1/3)

- 640,000,000 people each year worldwide make leisure trips
- 30% of them visit the Mediterranean
- 85% of the European coasts host approximately 2/3 of the European tourism industry
- Reckless waste of natural resources along with other environmental consequences
- Large number of arrivals in a relatively short period of time, by carefree people being on holidays
- The impact of this kind of magnified activity can be catastrophic for the environment

“GREEN” TOURISM (2/3)

- Tourists grow environmentally sensitive
- Concern about the energy footprint that a trip leaves to the environment
- The energy footprint influences the choice of destination, means of transportation, accommodation and activities
- “Green” Hotelling
- “Eco-tourists”
- 43,000,000 tourists consciously select environment-friendly hotels
- “Green” Tourism
- Adoption of ecological consciousness and incorporation of “green” aspects to the touristic activities
“GREEN” TOURISM (3/3)

Greece attracts more than 16,000,000 tourists/year

Tourism industry in Greece accounts for over 78,8% of GDP (along with the other components of the service economy)

Jobs related to the tourism industry is approximately 19% of the total labor force

Within Greece more than 100 “green” hotel units are located at the time, while more than 365 existing hotel units will convert into “green”

The Hellenic Archipelago takes up to 11,242 km of the country’s total 15,320 km coastline, consisting of 9,835 islands, islets and rocks.

Massive tourism activity with catastrophic environmental consequences

Hellenic Islands gather 58,5% of the country’s lodging establishments and 62,6% of hotel beds.

FEASIBILITY STUDY (1/10)

The operational, financial and technical analysis of a business problem is called a “Feasibility Study”

A “Feasibility Study” usually aims to roughly estimate the feasibility of a business plan, by quantifying costs and benefits, resulting to the decision to proceed if found feasible or not

1. Basic Idea, Description & History of the Investment Project
2. Market Analysis & Products Marketing
3. Technology, Mechanical Equipment & Raw Materials
4. Financial Analysis
5. Environmental Consequences

Generally referring to market analysis, product marketing, analysis of the production procedures, infrastructure and equipment, financial analysis and social consequences analysis.

“Feasibility Studies” are used in various types of investments and so the structure and contents are rather flexible.
FEASIBILITY STUDY (2/10)

Location of the Investment: Achilli, Skyros

Skyros
- Located at the Aegean Sea
- Biggest island of North.Sporades complex
- 210 km², 2,960 inhabitants
- Mountainous, Mediterranean climate
- Reached by local flights from Athens and by ship from the port of Kymi in Evia

Achilli
- One of the twenty island’s settlements
- Small coastal village over Achilli gulf
- Middle of Skyros, northern orientation
- Equidistancing port, airport and capital
- Hosts a marina for small boats and fishing refuge
- ~15 permanent inhabitants

FEASIBILITY STUDY (3/10)

Basic idea & description of the project

- Regularly-shaped land-plot
- Northern orientation
- 6,180.40 m²
- 5 min walking-time from marina
- 3*** Hotel
- Bioclimatic design, ecological operation
- Challenge for best R.E.S. exploitation & ecological materials
- Hosting main & auxiliary infrastructure & surrounding and outdoor activities
Basic idea & description of the project

- 27 Independent Apartments to Rent (of either 50 or 100 m² each)
- 60 Beds in total
- Administration building of 200 m² (Reception, Office & Restaurant)
- Underground Parking & Storage
- 24/7 room service / Free parking / Restaurant
- Skyrian ponies farm / Free bicycles provision / Biological products

Scenarios were built in order to arrive to conclusions about the most efficient financial solution:

- Development of a hotel unit + 6 independent residences to be sold in advance (in order to gain extra capital to cover the construction costs)
- Development exclusively of apartments to rent (postponing the investment’s first income until the first year of operation & after the completion of constructions)
Market analysis & competition

- 69 operational lodging facilities of various categories
- No other hotel unit operating in Achilli so far
- No other “green” hotel units exist on the whole island
- Unique & appealing upcoming investment

Technology, Mechanical Equipment & Materials

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<th>Quantity</th>
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<th>Total</th>
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<td>Total</td>
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Diagram: Site plan with zones A and B.
Financial Analysis

Financial Analysis of the Bioclimatic Architecture Hotel Option

20-year CashFlow Analysis of the Bioclimatic Architecture Hotel Option

Financial Analysis

Financial Analysis of the Conventional Architecture Hotel Option

20-year CashFlow Analysis of the Conventional Architecture Hotel Option
FEASIBILITY STUDY (10/10)

Financial Analysis

Bioclimatic Architecture Hotel:
- IRR = 13%
- NPV = 2.787.805,72 €
- Break Even Point -> 9 yrs

Conventional Hotel:
- IRR = 11%
- NPV = 1.903.655,02 €
- Break Even Point -> 11 yrs

NPV (Net Present Value)

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

IRR (Internal Rate of Return)

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NPV = \sum_{t=0}^{N} \frac{C_t}{(1+i)^t}
\]

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<th>If...</th>
<th>Then...</th>
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<td>IRR &gt; cost of capital</td>
<td>accept the project</td>
</tr>
<tr>
<td>IRR &lt; cost of capital</td>
<td>reject the project</td>
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If IRR > cost of capital, accept the project; if IRR < cost of capital, reject the project.

IRR > cost of capital: the investment would add value to the firm. The project may be accepted.
IRR < cost of capital: the investment would subtract value from the firm. The project should be rejected.
IRR = 0: the investment would neither gain nor lose value for the firm. We are indifferent in the decision whether to accept or reject the project. This project adds no monetary value. Decisions should be based on other criteria, e.g., strategic positioning or other factors not explicitly included in the calculation.

Environmental Consequences

- Study of the environmental consequences of the investment
- Determines the importance of the above consequences’ impact on the social, economic, financial & technical potential of the investment’s implementation

European Union
- Obligatory
- Describes the technique & procedure during which data about negative consequences is collected from the investor & other sources
- Taken into account on whether investment could proceed or not

Greece
- Law 1650/1986
- Provides the legal framework on studying environmental consequences
- Applied since 1990
- Obligatory for complex hotel units
CONCLUSIONS

- Investments of the Future
- Environmental Benefits
- Low Operation Costs
- Legislation Motivations & Benefits to Invest

*Even though the construction cost is higher, due to the lower operation cost along with the high rate of return, a “green” investment is a Feasible & Profitable Investment*