CAPS - Project

Conversion of papermill sludge into absorbent

Company overview

- Technological, Logistic and Environmental Center Ltd.
- SME company established in January 2008.
- Private R&D company oriented towards the development of the green and sustainable technologies.
- Acredited laboratory for fuels and biofuels quality assurance.
- 5 highly educated and motivated employees with different backgrounds.
- Company networks includes experts and institutions.

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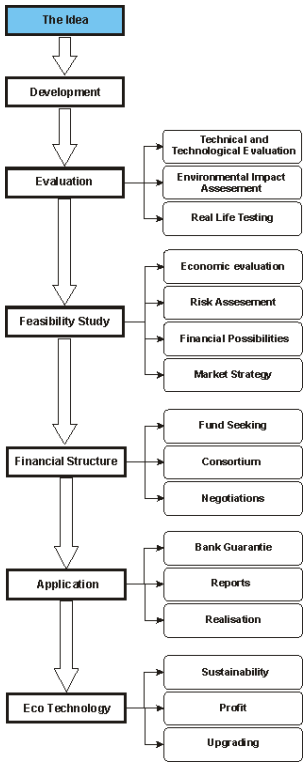
The Idea

- The R&D company Insol Ltd. has researched different alternative materials for landfills capping. Among them wasted papermill sludge (PMS).



- PMS has revealed a lot of usefull characteristics depending on its treatment.
- It is a light weight material with high sorbency for hydrophobic substances and heavy metals.
- Incineriation under controlled conditions forming vitrified granules with high sorbency for hydrophilic substances.

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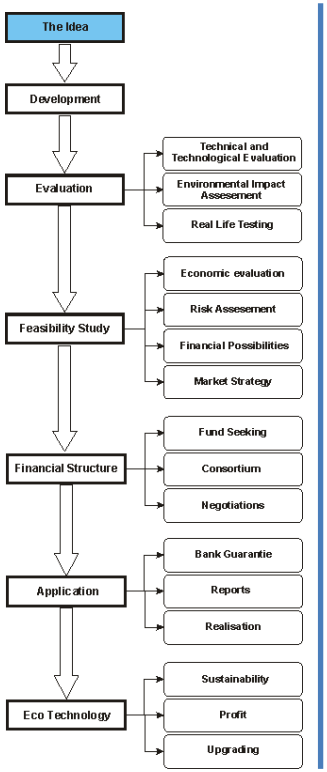
The Idea



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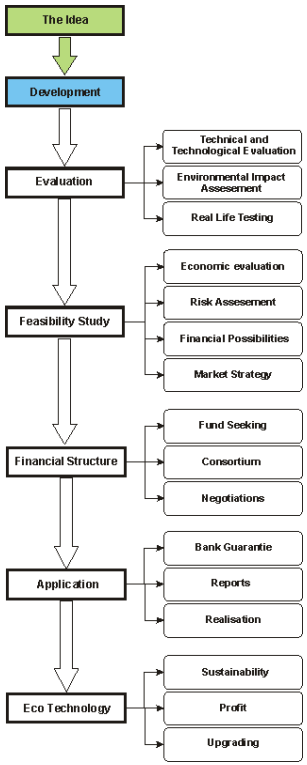
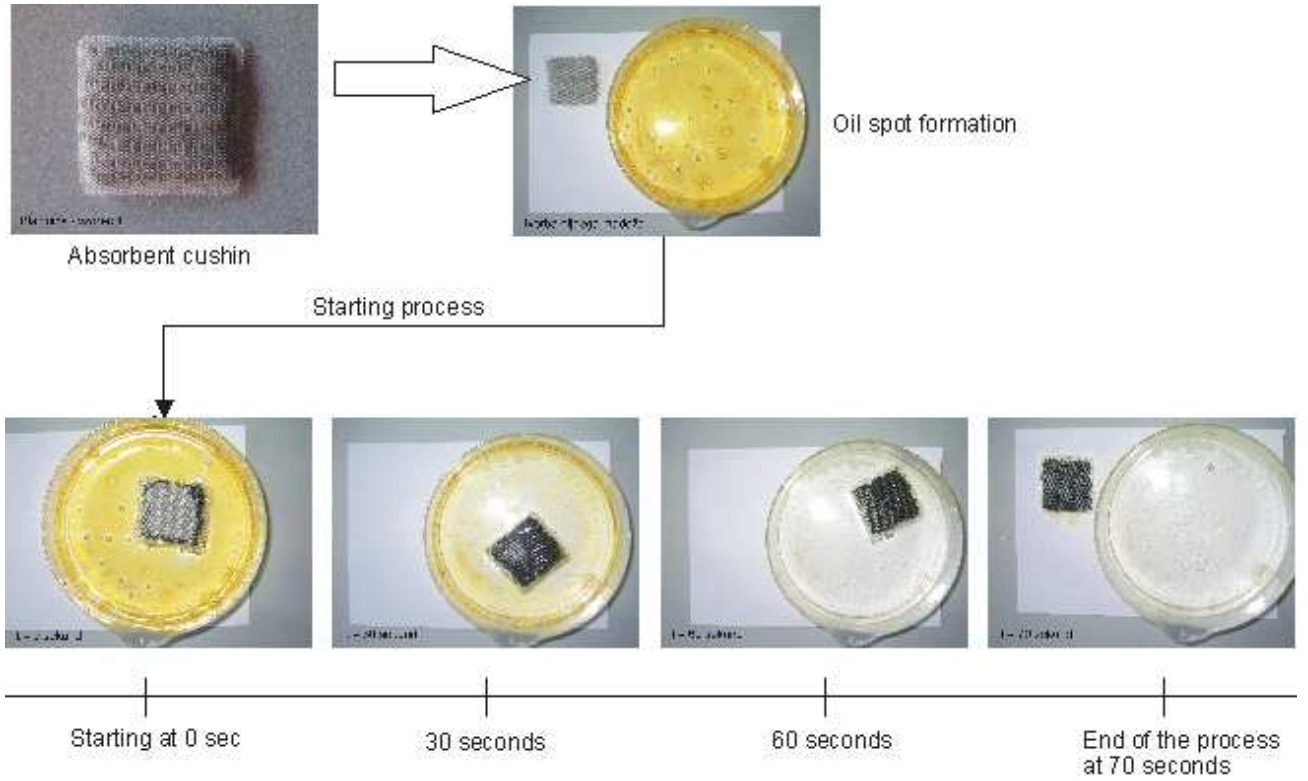
Development

- **Laboratory testing in order to establish PMS capabilities.**





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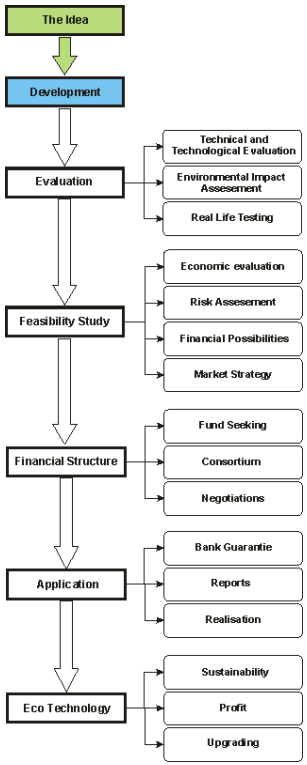
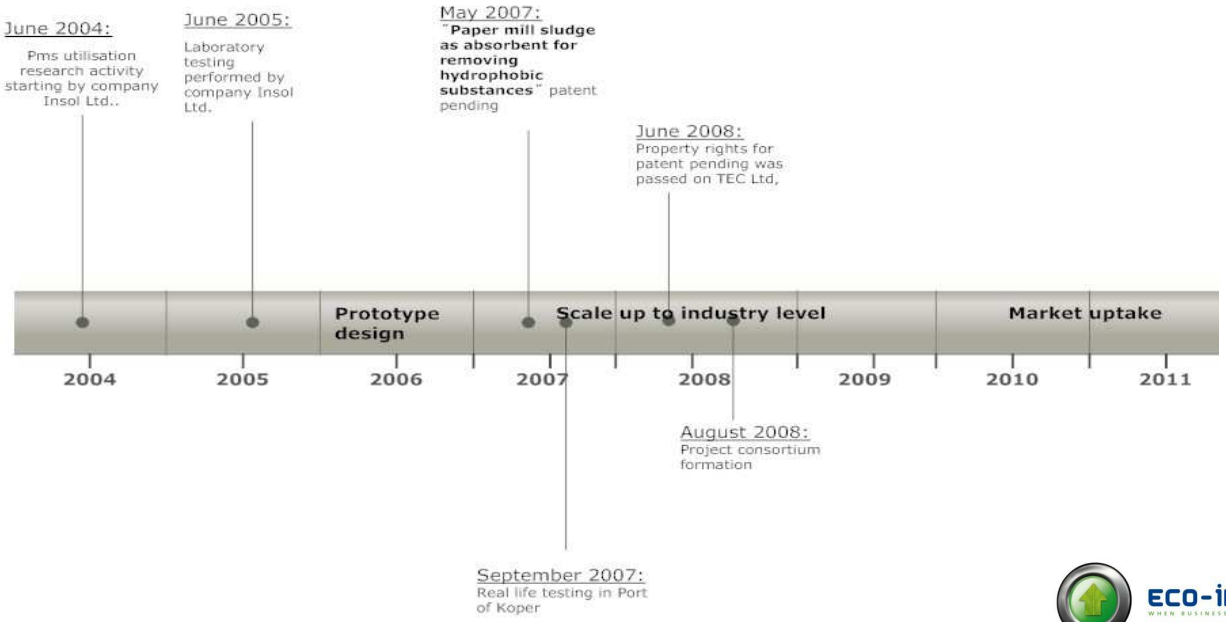
Development

- Company Insol Ltd. has acquired property rights.
- Insol Ltd. has passed the know-how to the company TEC Ltd. for scaling up the technology.
- TEC Ltd. has prepared foundations for technological process.





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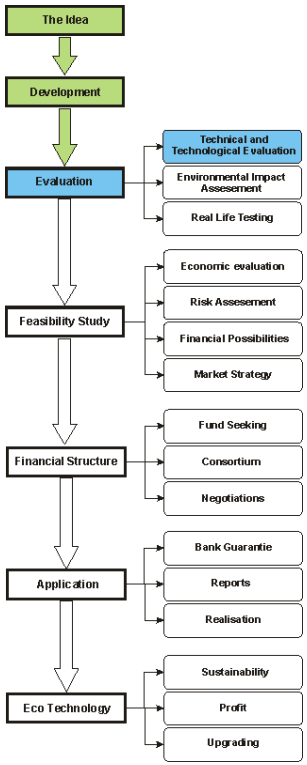
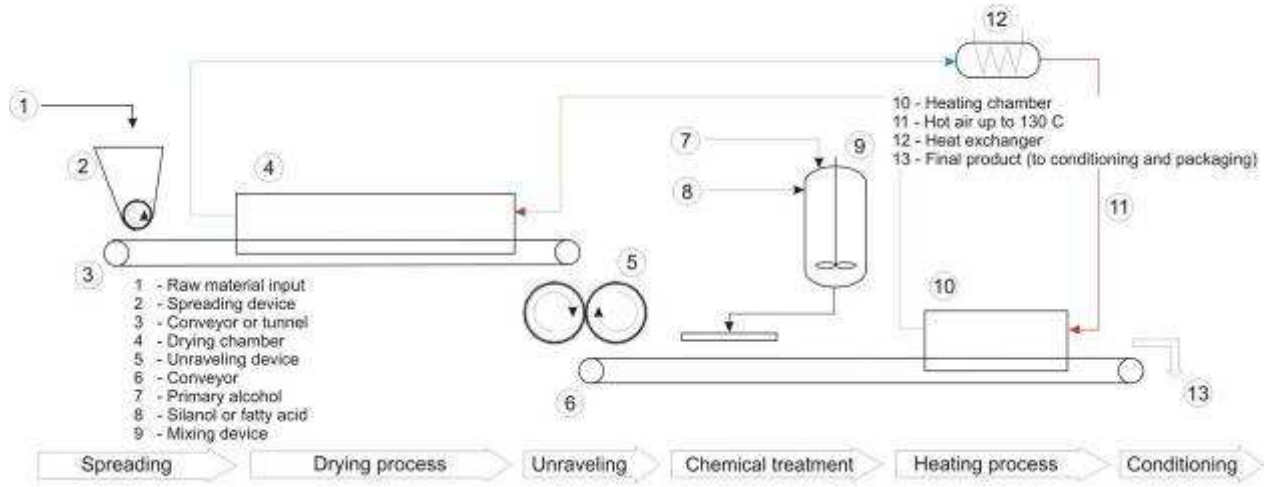
Evaluation - Technological

➢ **Description and evaluation of the cruicial parameters of the technological process.**





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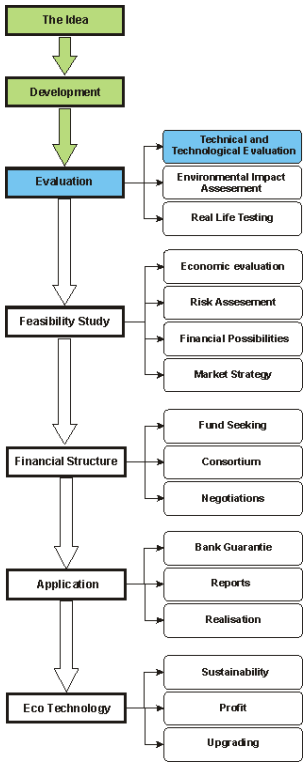
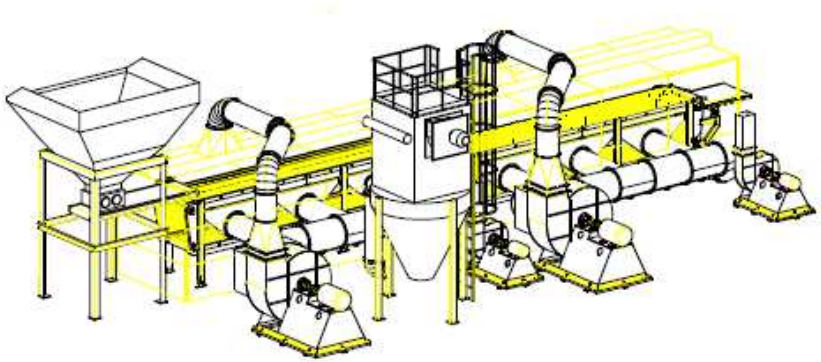
Evaluation - Technological

- Design of the process line.
- Preparation of the technical documentation.
- Testing and evaluation of the particular part of the processing equipment





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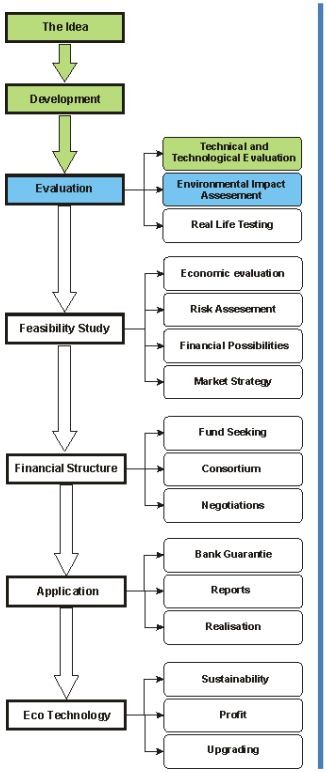
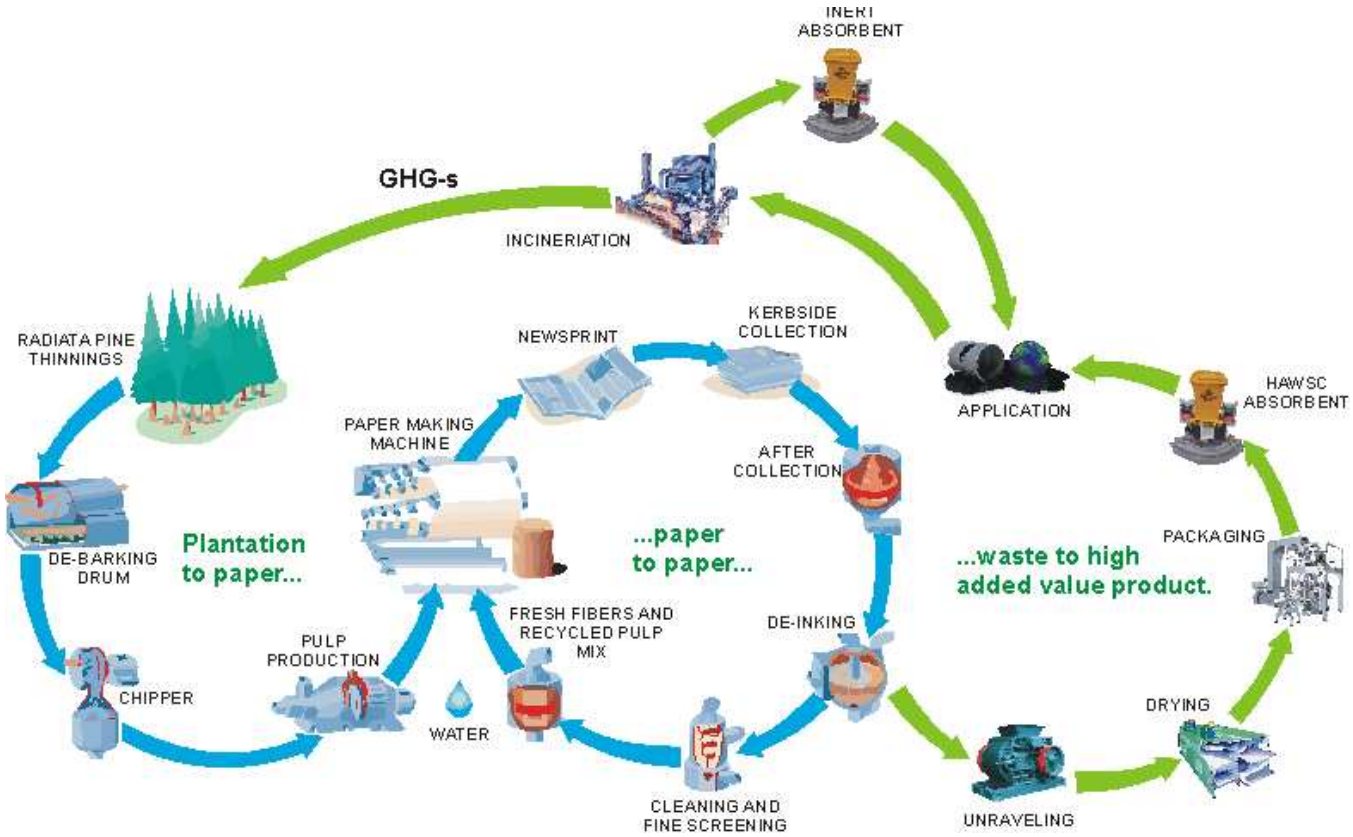
Evaluation – Environmental Impact

- **Definition of the LCA inventory.**





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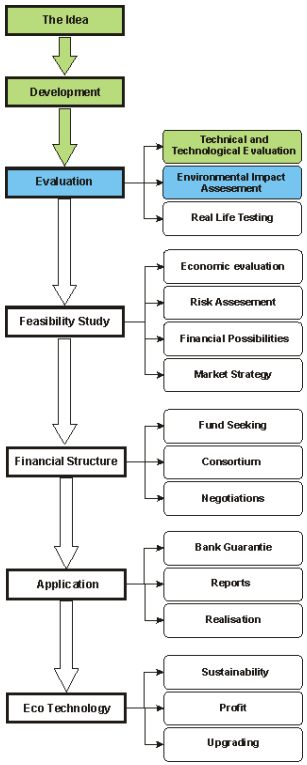
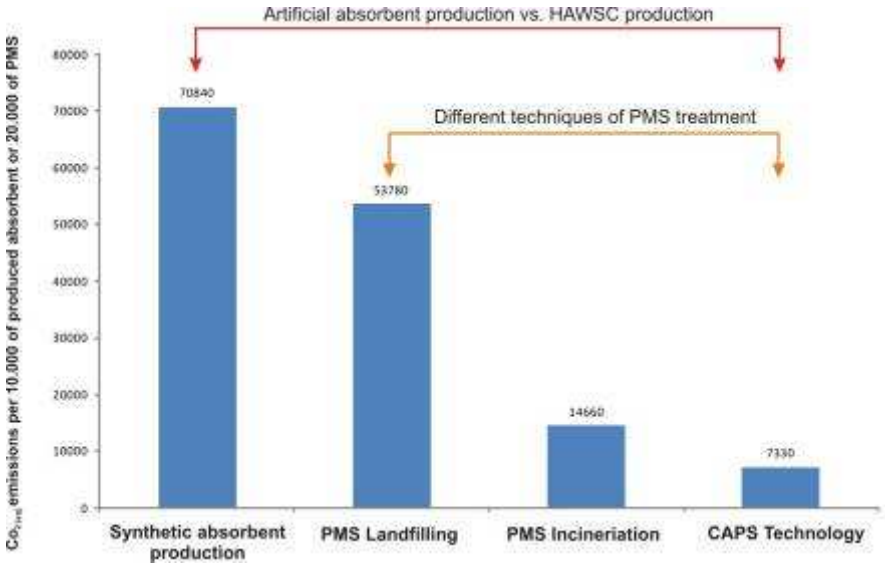
Evaluation – Environmental Impact

- **Calculation of the inveronmental impact.**

Parameter per 1 kg of product	CAPS	Landfilling	Incineriation	Replacement by exp. PP
Raw material sources	-	-	-	1,82 kg of crude oil
Energy for production	1,46 MJ	-	-	101,1 MJ
Calorific value	33,5 MJ	-	6,2 MJ	37,0 MJ
CO_2 emissions	0,73 kg	2,69 kg	0,73 kg	3,11 kg
CH_4 emissions	-	0,24 kg	-	-
Waste generated	-	1,00 kg	0,37 kg	0,003 kg
Energy exploitation	33,5 MJ*	-	6,2 MJ	143,0 MJ*





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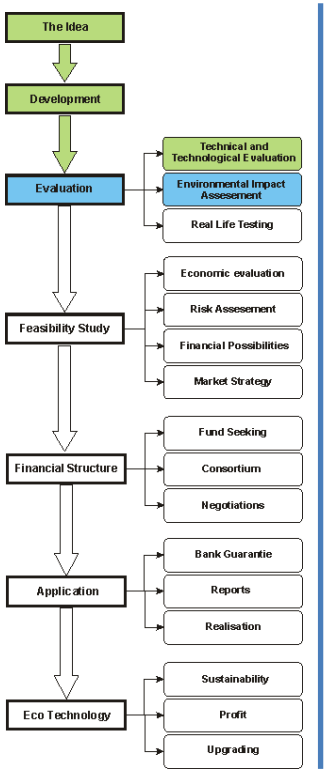
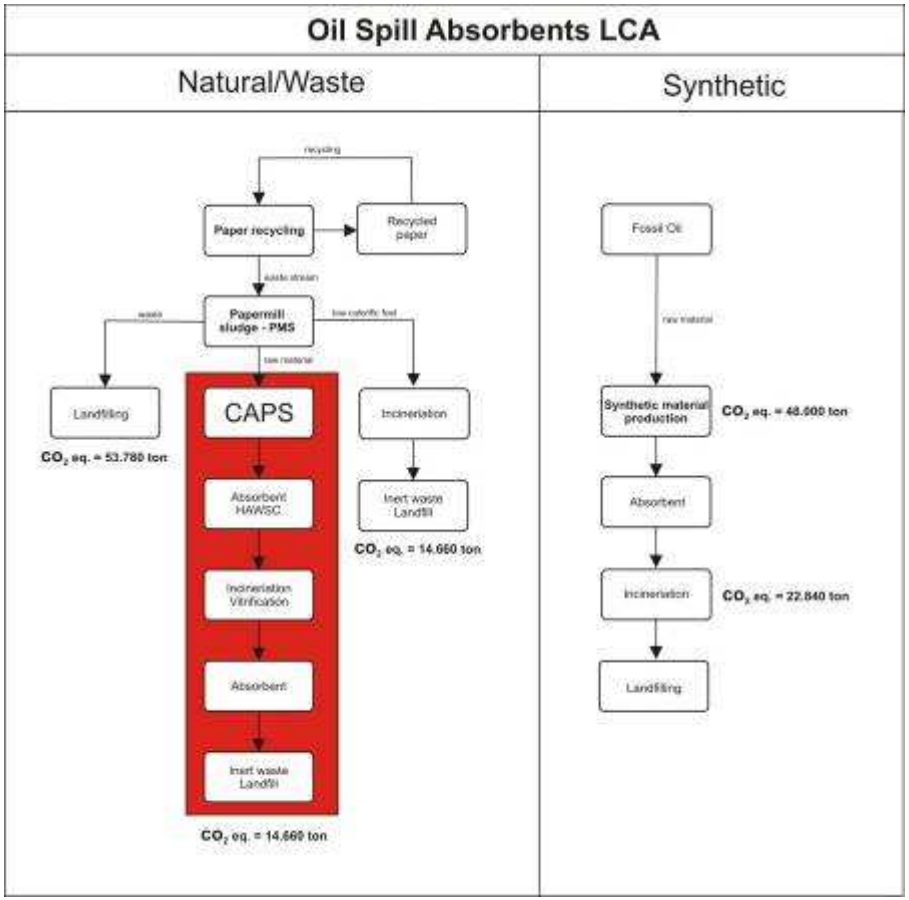
Evaluation – Environmental Impact

- **Performing LCA Analysis .**





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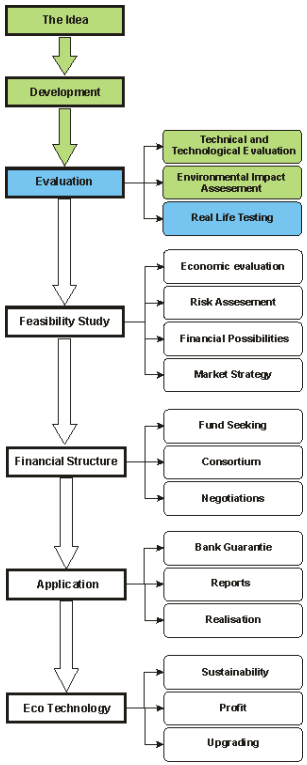
Evaluation – Real Life Testing

- **Real life testing of the HAWSC in the Port of Koper.**



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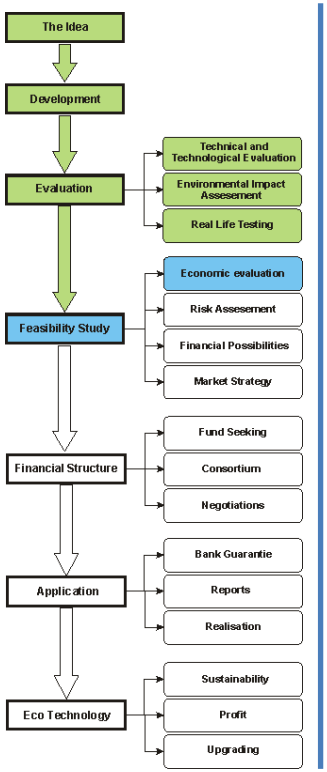
Feasibility Study - Economic Efficiency

- Calculation of the economic efficiency for three different scenarios.



	Paper-mill model	EEP model	Standalone model
Investment Costs	3 844 060.00	4 344 000.00	4 344 000.00
Total Revenue	6 865 040.00	7 220 764.00	7 220 764.00
Total Costs	2 264 730.26	3 023 734.50	4 900 568.88
Discount Rate in %	6.00	6.00	6.00
NPV	25 351 453.20	22 476 966.91	11 426 009.85
Economic Break Even Point	2 293.33	2 635.55	4 131.47

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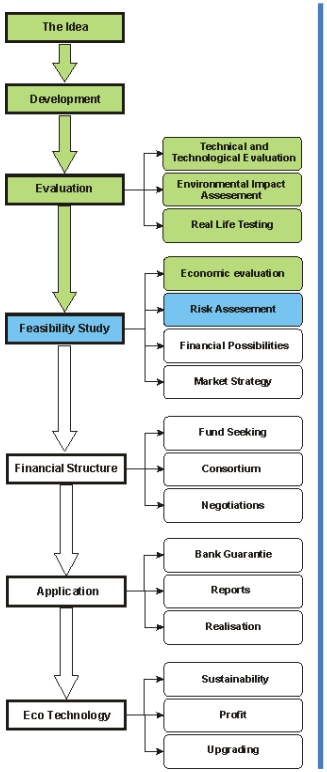
Feasibility Study - Risk Assesement

- **Risk assesement anlysis for production plant implementation.**



		SO Standalone	WO Joint Venture	ST Hiring EcoPark	WT Sold out
AHP	**Weights**	0,174	0,426	0,143	0,258
	Ranking	3	1	4	2
ANP	**Weights**	0,239	0,413	0,155	0,193
	Ranking	2	1	4	3
Q-SWOT/AHP	**Weights**	0,185	0,359	0,239	0,218
	Ranking	4	1	2	3
Q-SWOT/ANP	**Weights**	0,233	0,347	0,249	0,171
	Ranking	3	1	2	4
Expert Choice	**Weights**	0,220	0,363	0,188	0,229
	Ranking	3	1	4	2
Average	**Weights**	**0,210**	**0,382**	**0,195**	**0,214**
	Ranking	**3**	**1**	**4**	**2**
Std dev.		**0,029**	**0,035**	**0,048**	**0,033**

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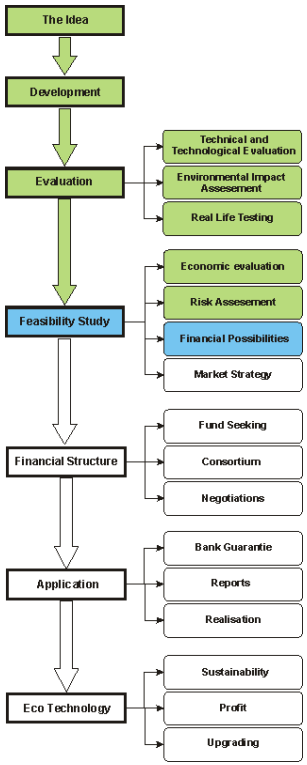
Financial Possibilities



- **Preparation of a realistic financial framework.**
- **SME-s have inovative ideas and highly motivated teams.**
- **SME-s are usually weak with financial and human resources.**
- **State or European co-funding is essential to implement new ideas and technologies.**

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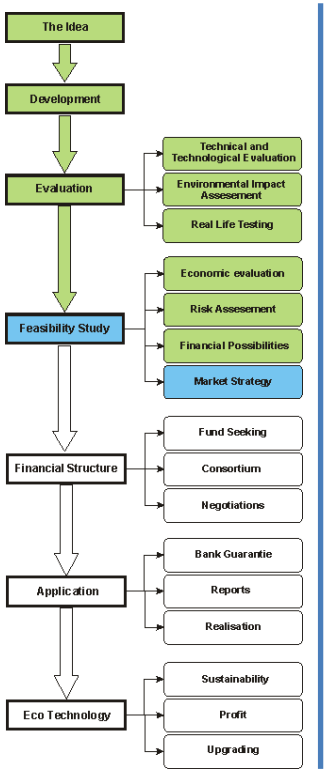
Market Strategy

- **Recognize advantages and weakneses of your product.**



	Absorbs Oil	Hydrophobic	Floating on the water	Incinerable	Non-Leaching	Absorbs instantly	Waste Minimizations	Sustainability	Made from recycled material	Contains Silica	Anti-Static	Cost per Unit Absorbed	Reusing of used material	Disposal cost per unit absorbed
Cellulose Absorbents	•	•		•	•	•	High	High	•		•	Low		Low
Peat Moss Absorbents	•	•	•	•	•	•	Medium	Low			•	High		Medium
Expanded Polypropylene	•	•	•	R		•	High	Low				High		Medium
Clay Absorbents	•						Low	Low		•	•	Medium		High
Fuller Earth Absorbents	•						Low	Low		•	•	Medium		High
Diatomaceous Earth Absorbents	•		•				Low	Low		•	•	Medium		High
HAWSC Absorbent	•	•	•	•	•	•	High	High	•		•	Low	•	Low

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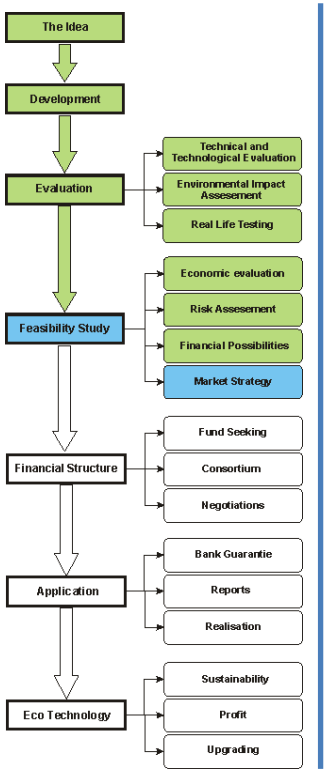
Market Strategy

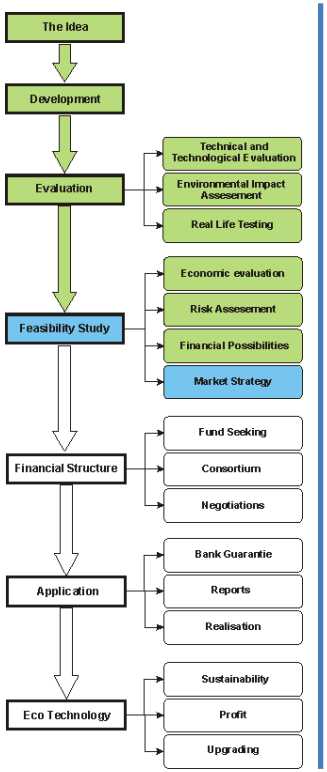
- **Perform detailed market research for your product or technology.**

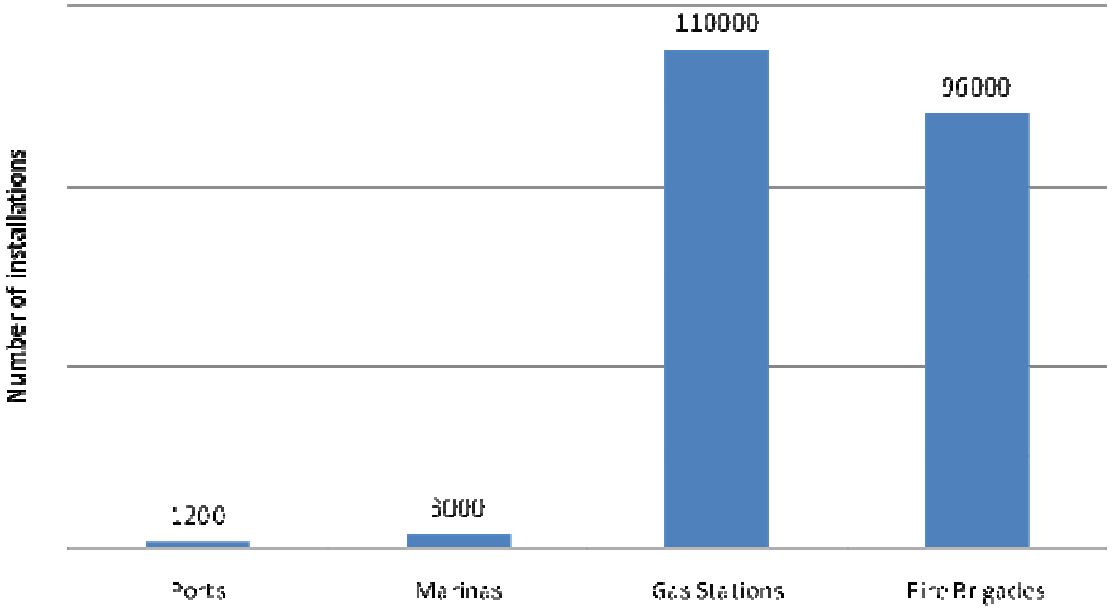


	Water surface cleaning	Absorbtivity kg/kg	Price €/kg	PP €/kg abs
Cellulose Absorbents	No	4,10	0,45	0,11
Peat Moss Absorbents	Yes	7,40	1,33	0,18
Expanded Polypropylene	Yes	24,40	5,12	0,21
Clay Absorbents	No	1,00	0,28	0,28
Fuller Earth Absorbents	No	1,40	0,28	0,20
Diatomaceous Earth	Yes	1,28	0,23	0,18
HAWSC	Yes	7,36	0,62	0,08

Market Strategy

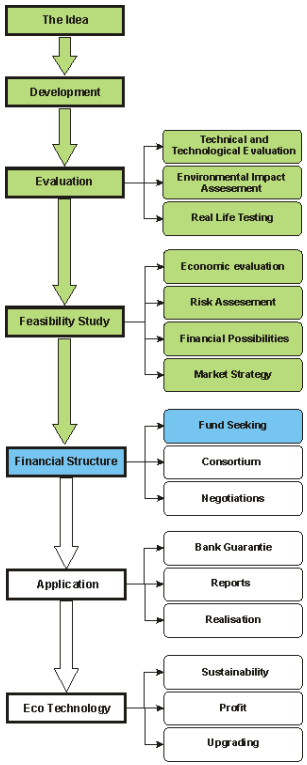
- European Union (EU-25) produces more than 14.400.000 Mt of PMS per year.
- HAWSC can uptake up to 20 % of the European market of absorbents.





Fund Seeking

- Finding apropriate national or European co-funding possibilites.
- Eco – Innovation Programe co-funds ecological projects up to 50 % of eliglible costs.
- If your project is already at an advanced stage and you dispose with relevant data then the preparation of the project proposal is simple.
- You can pre- check the adequacy of your project in advance trough web application http://ec.europa.eu/environment/eco-innovation/contact_en.htm.
- It is useful to contact a consultant with some experience with the application procedure (adaptation of your project to targeting points, budget preparation, internal evaluation of application, electronic delivery of application “on-time” …).
- A realistic budget is the most important part of the project proposal (prepare budget botom-up!)



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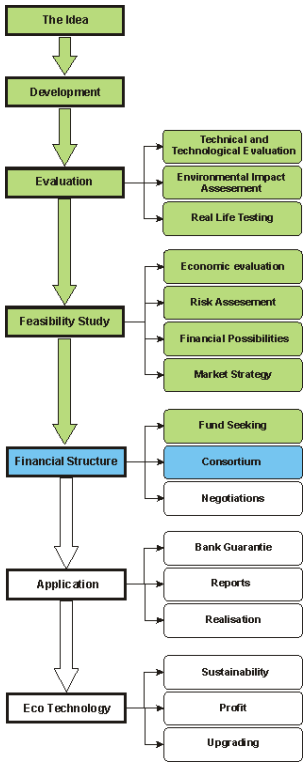
Consortium



- SME-s are usually weak regarding financial and human resources.
- 50 % of co-funding is not enough for the finalization of the project
- Find a partner which is complementary to you and give EU dimension to your project.

- Friendly company with appropriate financial backgroud.
  - A possibility is to establish a ‘joint – venture’ after the finalisation of the Project

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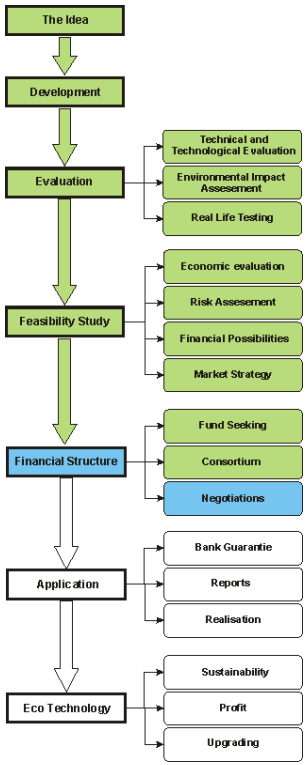
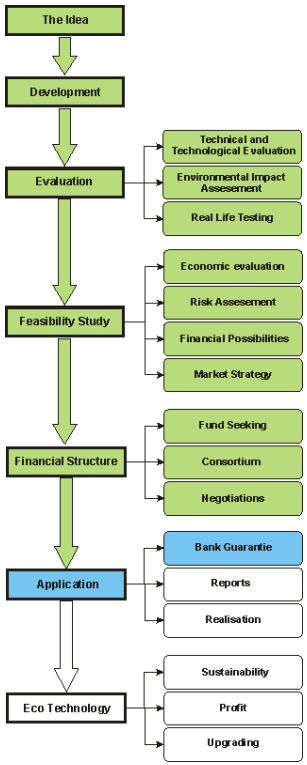
Negotiations



- **Very important part of the process.**
- **EACI Project Officer will lead you trough the negotiations.**
- **It usually takes one to two months.**
- **'Defend' your project proposal with additional facts, measurements, analysis.**

Bank Guarantiee

- The obtainment of a Bank guarantiee is crucial to get pre-financing.
- SME-s are usually weak with financial resources.
- Due to a financial crisis the bank guarantiee can be a problem
- Good bussines plan can be helpfull.
- Consortium partners can help.



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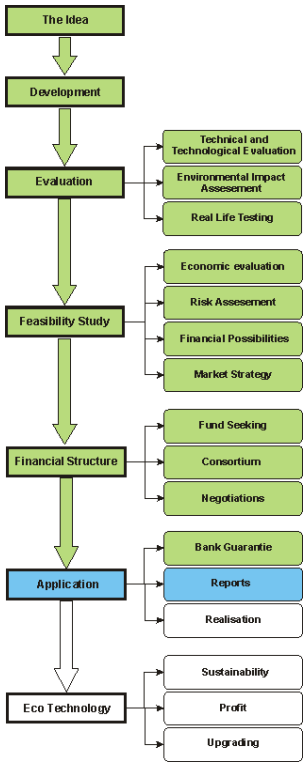
Reports

- Follow the deadlines agreed in the Project Proposal.
- Submit reports on time.



- Contact your Project Officer to help you prepare a right report according to time scedule.
- Web page is compulsory and it can help you to co-ordinate the consortium (http://caps.toc.si).

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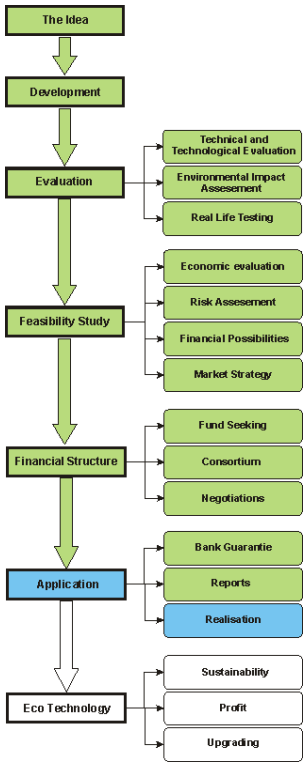
Realisation



- TEC Ltd. is co- operating in the realization of the CAPS Project with the Vipap Videm Krško papermill Inc.
- Vipap Videm Krško Inc. brings to the project technical support, working place, material and energy.
- Vipap Videm Krško Inc. will improve their environmental impact and it will introduce new high added value product in their product portfolio.
- CAPS production line will be set up from 1st of September 2010 (12 months after the start of the Project)
- 2nd production line will be set up in Finland by the year 2012.

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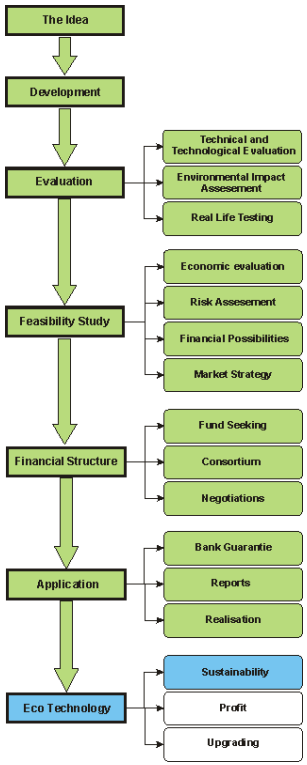
Sustainability



- CAPS project exploits industrial waste and wasted energy from paper industry with the aim of producing a high added value product to be used in chemichal (refineries,etc.), logistic and touristic industry as well as by fire brigades and disaster relief organisations.
- It complies with the eco industrial symbiosis theory.
- Improves environmental impact (decrease the waste quantity for 20000 tons/year, decrease GHG-s up to 1,96 ton of CO_2 (eq.) per 1 tone of processed PMS).
- The application of the CAPS technology will raise awareness on how wasted material and energy can be used as valuable raw material or energy in other industrial sector with economic and environmental gains.
- The application of the CAPS technology will allow for substantial job openings and also important, the preservation of existing jobs in various related sectors.

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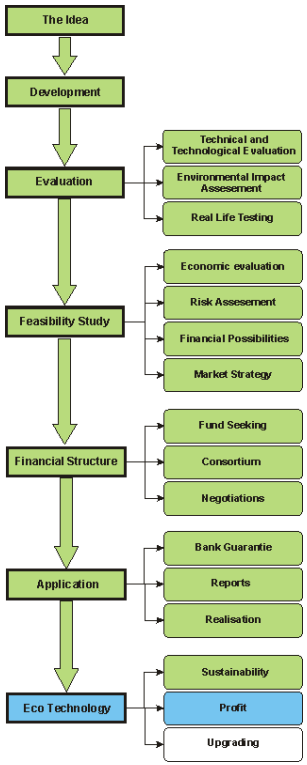
Profit

- Ecological oriented technologies can be highly profitable.



- With an investment of about 3,8 Mio € in a CAPS production line with a production capacity of about 10.000 tons of absorbent per year, the paper mills can decrease their GHG-s emissions of around 0,58 tone per 1 tone of the produced paper and earn approx. 90 € for each tone of spared CO2 based on the presumption that HAWSC will be sold 30 % cheaper than the existing natural and artificial absorbents present on the market nowadays.

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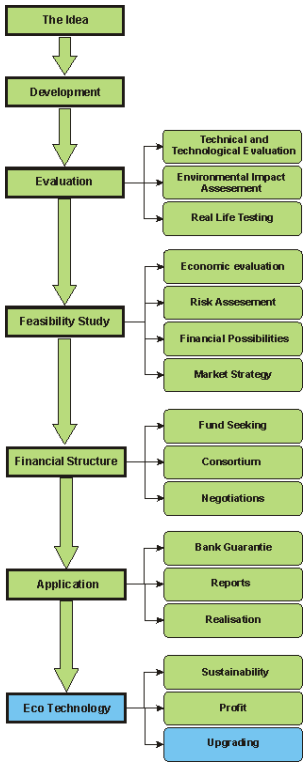
Upgrading

- **Selection for co- financing by EACI and recognition of your work by the broader public (at EU level) will give to the SME-s additional motivation for the improvement of their ideas and help to born new ones.**



- **TEC Ltd. is profiling as a company for development of alternative absorbent materials from different kind of wasted materials, research on sustainable technologies.**

- **Consultancy on financial possibilities (inc. EU funds)**

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There is no waste out there, there are just things about which we don`t like to think anymore.

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