PROJECT REPORT
02 - 03

Rannsóknastofnun fiskiðnaðarins

JANÚAR 2003

ORKUSPAR
An Energy Efficiency Improvement Simulator (3rd Report)

Eva Yngvadóttir

Skýrsluágrip Rannsóknastofnunar fiskiðnaðarins
Icelandic Fisheries Laboratories Report Summary

Titill / Title	ORKUSPAR-The Energy Efficiency Improvement Simulator		
Höfundar / Authors	Eva Yngvadóttir		
Skýrsla Rf /IFL report	02-03	*Útgáfudagur / Date:*	January 2003
Verknr. / project no.	1508		
Styrktaraðilar / funding:	Commission of the European Communities; SAVE II, IFL, TÍ, OS, EVI, WNRI		

Ágrip á íslensku:

Þessi verkefnaskýrsla greinir frá þriðja og síðasta verkefnafundi í fjölþjóðlegu verkefni sem nefnist "ORKUSPAR-hermir til að bæta orkunýtingu." Um var að ræða tveggja daga verkefnafund sem haldinn var í Stokkhólmi dagana 20-21 janúar 2003.
Markmið fundarins var:

- að fara yfir þá vinnu sem búið er að framkvæma í verkefninu fram að þessu
- að ræða hugmyndir sem komið hafa fram um breytingar á herminum
- að ræða kynningu á herminum
- að ræða möguleika á framhaldsverkefni

Verkefnið hefur gengið vel. Nú er verið að leggja lokahönd á orkuherminn Orkuspar. Verkefninu lýkur formlega 31. mars 2003

Þáttakendur í verkefninu eru:
Ísland: Rannsóknastofnun fiskiðnaðarins, Tækniháskóli Íslands, Orkustofnun, Grandi hf og Skipatækni ehf.
Svíþjóð: Energivision EB og Fiskeriverket
Noregur: Vestlandsforskning

Lykilorð á íslensku: *Orka,sparnaður,hermir,sjávarútvegur,flutningaskip,verkefnafundur*

Summary in English:

This project report describes the third and final meeting in a European project called "ORKUSPAR – an energy efficiency improvement simulator", held in Stockholm 20-21 January 2003.
The goal of the meeting was:

- to discuss the work that has been done in the project until now
- to discuss the trials and modifications that have been made regarding the simulator
- to discuss property rights, user accessibility and the responsibility for the maintenance of the final product
- to discuss dissemination of the simulator.
- to discuss a new project, a sequel of Orkuspar.

The project is proceeding well. The final work is beeing made regarding the ORKUSPAR simulator. The project will end March 31. 2003.

The participants in the project are:
Iceland: Icelandic Fisheries Laboratories, The Technical University of Iceland, The National Energy Authority in Iceland, Grandi hf, Skipatækni Ltd.
Sweden: Energivision Stockholm, National Board of Fisheries in Sweden
Norway: Western Norway Research Institute

English keywords: *Energy, economy, simulator, fishing industry, freight shipping, work meeting*

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1. INTRODUCTION

The third and final meeting in the project "ORKUSPAR – An Energy Efficiency Improvement Simulator," was held in Stockholm, Sweden, on January 20-21 2003. ORKUSPAR is a two year project which officially started on April 1. 2001. At the meeting in Stockholm the contact person to the EU Commission, Mr. Pedro Ballesteros Torres, performed his technical visit to this project.

Since the second meeting, which was held in Reykjavik in February 2002, the participants have worked on different phases in the project with the main focus on the specifications, programming and trial and suggestions for modifications for a fishing vessel. Furthermore, an excel program for energy use in land-based fishing industry has been developed. The participants submitted an interim report to the Commission in October 2002. The project has been introduced at several occasions during this period. One participant in the project, Swedish Energy, has decided to cancel its participation in the project. The final step in the project will be focusing on modification and dissemination of the simulator. The project will officially end on March 31. 2003.

2. OBJECTIVE

The goal of this third meeting was to:

1. Discuss the trials and modifications that have been made for a fishing vessel.
2. Discuss the land-based fishing industry and cargo ships.
3. Discuss property rights, user accessibility and the responsibility for the maintenance of the final product.
4. Discuss dissemination.
5. Discuss a new project, a sequel of Orkuspar.

3. DISCUSSION

At the beginning of the meeting, the participants from the different countries introduced the work they have been doing since the last meeting in February 2002.

Iceland: Participants from Iceland have been working on phase 4 - Trial and modifications. A student at the Technical University of Iceland made his final thesis on the project Orkuspar, phase 4. A report, which points out errors and makes suggestions for modifications, has been written and sent to the participants. The output design of the simulator needs some improvements.
An excel program for the land-based fishing industry has been developed further.

The Orkuspar project has been introduced in several ways:

- March 2002: The project was introduced in a lecture at a workshop for Life Cycle Assessment in seafood, held in Reykjavik.
- September 2002: The project was introduced as a poster and in a handout at The Icelandic Fisheries Exhibition 2002, held in Reykjavik
- October 2002: The project was presented in a handout at the 2nd International Seafood By-product Conference, held in Alaska, USA.
- November 2002: The project was presented as a poster in connection with a conference on the introduction on the EU 6th. Framework Programme in Perlan, Reykjavik.
- November 2002: The project was introduced in a handout and in a lecture at a LCA workshop in Roskilde, Denmark.

Sweden: Participants from Sweden have been working on the programming part of the simulator for the fishing ships. A prototype was ready to be tested in October 2002. The simulator will be an Internet-based program. The end users will thus have access to the simulator wherever they are in the world. This makes all update easier and also available for everyone at the same time.

Norway: Participants from Norway have adapted the specification for the fishing vessel simulator for cargo ships. The cargo ships are treated as fishing vessels but without the fishing gear. Questionnaires have been sent to 10 shipping companies to gather input data to test the simulator. A database on Norwegian cargo ships has been obtained from Marintek. The list embraces all dry goods ships frequenting Norwegian ports, a total of 229 vessels. The database contains the following data: vessel name, gross tonnage, vessel type, speed, year built (vessel), main engine (type, kW and year built). The data bank is useful in the work with the finalization of the simulator's specification for cargo ships.

During this third meeting, the modifications and errors were thoroughly discussed and the dissemination of the simulator was planned. Brainstorming about the role and further development of the simulator was done with Mr. Ballesteros participating.

Following is how the participants see the role and the development of the simulator in the future.

- The simulator could be used as an instrument for demonstrating the oil consumption and what can be done for saving in that field. It can be used to increase the awareness and show the impact of the oil consumption at different levels, that is from the administrators to the skippers. Not many administrators are aware how their decisions can effect the oil consumption.
- Focus on optimization to make the simulator more "intelligent," focus on different actions, e.g. the process of trawling which is the part of the fishing trip that accounts for up to 70 % of the total oil consumption. Focus on different users. Sort out the output, that is place more focus on the effects that changes have on the output.
- Future development-simplification, level of complexity makes it more user-friendly. Use the program in schools and make the students aware of the oil consumption since they will be the most important end users in the future. This is a tool that will give economical benefits by saving money and reduce the environmental impacts.

Mr. Ballesteros advised the participants to think ahead in the future and think big for further development of this simulator. The Commission wants to support fewer but larger

projects in the future. The Commission will not support further development of the simulator. The participants need to find a new angle for a new project. Potential support through the new programme "Intelligent Energy for Europe" was indicated.

4. RESULTS

Productive discussions between participants lead to the following main decisions:

1. Version 1 of the ORKUSPAR simulator will be ready at the end of this project. There are great possibilities to develop the simulator further in the future.
2. The suggestions for the modifications of the simulator will not all be done in this project but will be used for further development of the simulator in the future. Errors will be corrected. The importance and priorities were made for the errors and suggested modifications. Some output sheets are to be added. The cost will be calculated and then a decision will be made of which modifications are to be included.
3. Version 1 of the simulator for the fishing ships is complicated. There is a lot of input data that needs to be put in order to get the output. This is good for designers of fishing ships but could be too complicated for ship owners, keeping in mind that this simulator is for experts in this field and can be used as well as a tool for teaching students about energy usage under supervision of a teacher.
4. An excel program for the land-based fishing industry looks promising. It is simple to use.
5. An excel program for the fishing vessel has been made and it will be used to test the input data for certain sizes of cargo ships.
6. The simulator will be presented at seminars held in each participant's country. Each participant will organize 1-3 seminars with the key persons in this field and present the simulator. The ORKUSPAR simulator will be presented by e-mail to potential users throughout Europe.
7. Concerning property rights, user accessibility and responsible maintenance the version 1 of the ORKUSPAR simulator will be avaliable on the Internet free of

charge. This will be facilitated through the project´s homepage, http://www.rf.is/verkefni/Orkuspar/index.htm. The program and database will be accesses from a server at the Technical University of Iceland.

After the meeting, an action plan was made. The plan indicates clearly the work which each participant needs to perform and the date when it should be finished. This action plan is in appendix 2.

5. CONCLUSIONS

During this two day meeting, the participants had successful discussions about the trial and modification of the simulator and decisions were made regarding the dissemination of the simulator. The project will finish March 31st 2003 and the final report and cost statments will be submitted to the EU after that. The participants are willing to continue the co-operation in this field and are now thinking about strategies to continue that work.

6. APPENDIX

1. Proceedings from the meeting
2. Action plan

Appendix 1

Proceedings

Third meeting in the project "The Energy Efficiency Improvement Simulator ORKUSPAR", Stockholm, Sweden January 20.-21. 2003.

Sunday January 19th 2003

14.00 Excursion to the Vasamuseet

Monday January 20st 2003

Participants: IFL, TI, Skipatækni, OS, EVI, WNRI, SCIMUS, Fiskeriverket, EU Commission

9.30-12.00 Proceedings of the work since the last meeting in February 2002.

- Introduction (Eva Yngvadóttir)
- Phase 3, simulator development; the programming (Georg Saros)
- Demonstration of the simulator and phase 4, trials and modification for fishing ships (Baldur Jónasson)
- Cargo ships (Otto Andersen)
- Demonstration of land based fishing industry (Sigurjón Arason)

13.00-17.00 Discussions, all participants

- Phase 3 simulator development
- Phase 4 trials and modification of the simulator
- Land based simulator
- Cargo ships
- Further development of the simulator during the few weeks that are left in the project
  - Action plan for the work that remains.
- Status of the simulator at the end of the project:
  - A marketable product?
  - If not what then? A demo available on the Internet?
  - Location of the simulator
- Consortium agreement concerning property rights, user accessibility, and responsibility for maintenance of the final product
- Dissemination

Between discussions there will be coffee and lunch.
Joint Dinner

Tuesday January 21st 2003

Participants: IFL, TI, Skipatækni, OS, EVI, WNRI, Fiskeriverket

09.00 Discussion

- Further teamwork between the participants in this project.
- New projects sequel with Orkuspar

14.00 End of the meeting

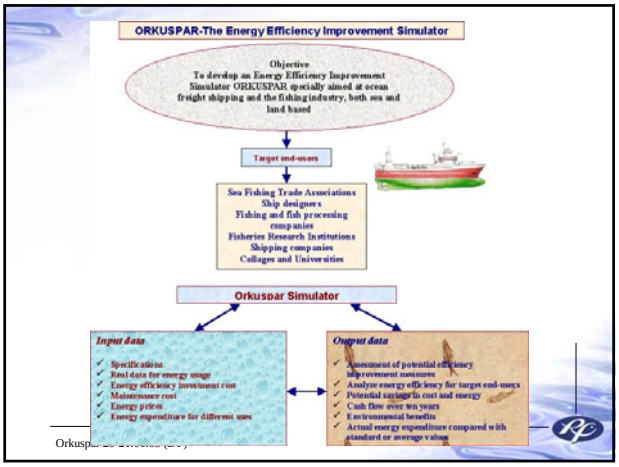
Third meeting in the project "The Energy Efficiency Improvement Simulator ORKUSPAR", Stockholm, Sweden January 20.-21. 2003.

Participants:

Pedro Ballesteros Torres	European Commission
Georg Saros	Energivision Stockholm AB, (EVI)
Jonas Klittmark	SCIMUS
Roger Olofsson	SCIMUS
Otto Andersen	Western Norway Recearch Institute, (WNRI)
Staffan Larsson	National Board of Fisheries, Sweden, (Fiskeriverket)
Björn Beckman	National Swedish Association of Fishermen
Baldur Jónasson	The Technical University of Iceland , (TÍ)
Árni Ragnarsson	The National Energy Authority, Iceland,(OS)
Sigurjón Arason	Icelandic Fisheries Laboratories, (IFL)
Eva Yngvadóttir	Icelandic Fisheries Laboratories, (IFL)

Status in the project ORKUSPAR

Eva Yngvadóttir (IFL)



ORKUSPAR

- The software simulates the economic and other benefits effected by divers measures, intended for instance to:
  - decrease primary fossil fuel consumption
  - improve energy efficiency of processing systems
  - improve automatic control and monitoring systems
  - decrease deleterious pollutant emissions
- The overriding aim is to decrease harmful gaseous emission to the atmosphere in a sustainable manner whilst trying to meet the targets set in Agenda 21 and subsequent Kyoto declarations.

Phase 1- Data collection

Principally responsible IFL

- Input data
  - energy efficient investment costs
  - maintenance cost
  - energy prices
  - energy expenditure for different uses
  - potential savings in energy
  - potential savings in associated environmental benefits

Phase 1- Data collection

- Output data
  - attained savings in cost and energy
  - cash flow over ten yeras
  - calculated payback
  - environmental benefits
  - actual energy expenditure

Phase 2-Data analysing and sorting

Principal responsible TÍ

- Collected data along with data available from previous surveys carried out in the European Union and the assosiated states will be accessed, collated, sorted and interpreted. The data that are relevant and of the prescribed quality are added to the input data bank. This task will require extensive co-operation between the project partners and the End-user Group.

Phase 3
Simulator development
Principal responsible EVI

- Develop the necessary routines and subroutines of the ORKUSPAR simulator to process the input data. The model will include a description and specification of the computer program to be developed.
- The specification will include:
  - the input values to the model,
  - the database values that should be possible to change by the user of the simulator
  - the mathematical formulas
  - the end user interface
  - how the results should be presented in tables and diagrams

Phase 4 Trials and modification
Principally responsible IFL

- Experimental runs of the software under real conditions. The project partners will carry out the testing in co-opertaion with end-users.
- Copies of the simulator and relevant manuals will be made available to pre-selected end user group for try out
- An intensive follow-up activity will be used to audate and modify the simulator.

Phase 5 Dissemination
Principally responsible IFL

- promotional brochures will be prepared jointly byt he project partners and distributed
- Technical document and user manuals will be made
- ORKUSPAR will be:
  - described in trade journal,
  - shown at trade exhibitions
  - demonstrated through commercial and/or research contracts provided by the project partners

Phase 5 cont.
2002

- March 2002; Lecture at a workshop for Life Cycle Assessment in seafood
- September 2002; A poster and handout at The Icelandic Fisheries Exhibition 2002
- October 2002; A handout at 2nd International Seafood Byproduct Confernece
- November 2002; A handout and introduced in a lecture at an LCA workshop in Roskilder

Phase 6 – project management

- Interim report
- Payment 2
- Final report
- Cost statments
- Final payments

Orkuspar, The Energy Efficency Improvement Simulator

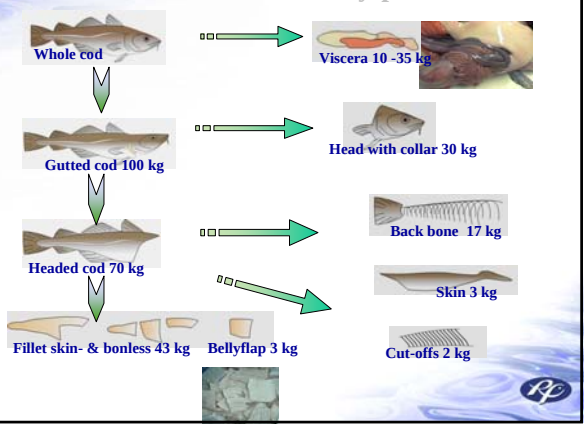
European Commission Project no: SAVE 4.1031/Z/00-029

Meeting in Stockholm, 20.-21. January, 2003

Landbased production of ground fish
Electrical energy consumption
Sigurjon Arason (IFL)

ORKUSPAR
The Energy Efficency Improvement Simulator
European Commission Project no: SAVE 4.1031/Z/00-029

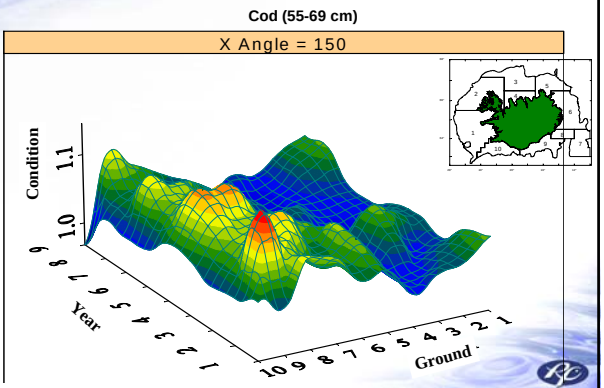
Production of cod fillet — By-products



Condition, defined by sectors and years

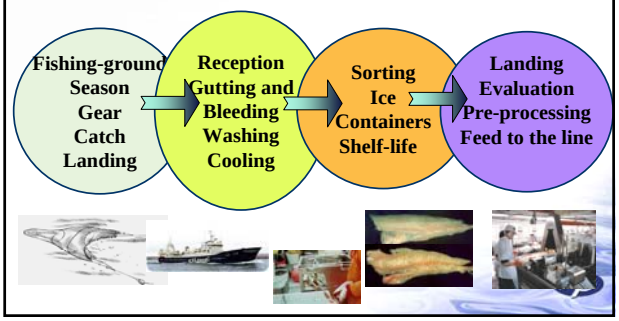
Cod (55-69 cm)

X Angle = 150



(B. Eyjólfsson ofl. 2001)

The Chain:
From Catch to Processing



Information about fish biology

Fish biology

Gruond fish

	Distribution	Average	Standard deviation
Distribution of fish	Normal	2,5	1,0

	Weight upper limit
Small fish	1 kg
Medium sized fish	5 kg
Big fish	> 5 kg

	Number fish	Quantity	Fjöldi fiska
Small fish	2834	6,68%	2834
Medium sized fish	10796	92,70%	10796
Big fish	36	0,62%	36

Redfish

	Distribution	Average	Standard Deviation
Distribution of fish	Normal	0,5	0,1

	Weight upper limit
Small fish	0,35 kg
Medium sized fish	0,8 kg
Big fish	> 0,8 kg

	Number fish	Radio
Small fish	1055	6,68%
Medium sized fish	9168	93,18%
Big fish	8	0,13%
Production weight	10223	100%

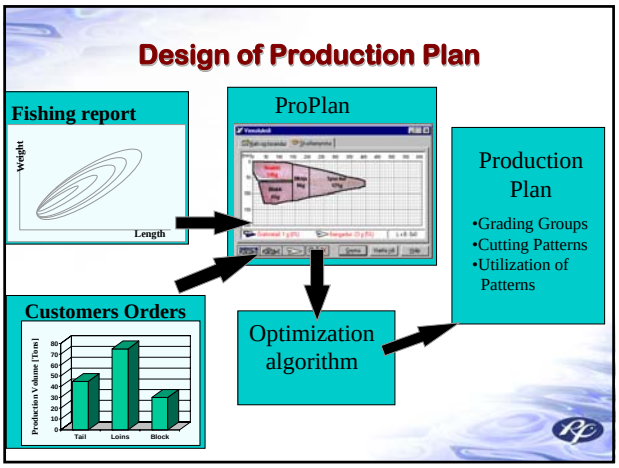
Influence of weight and yield on processing capasity of cod

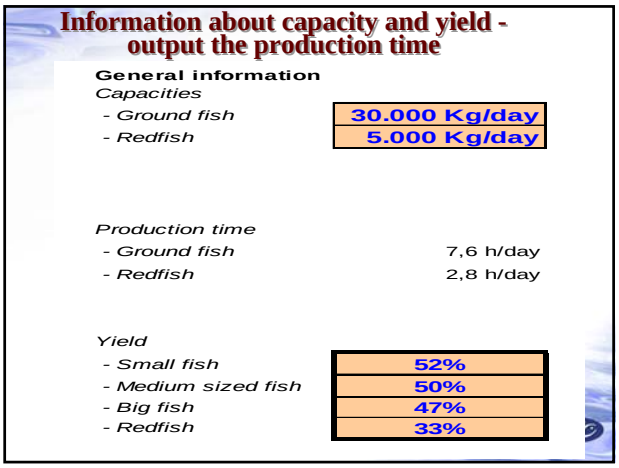
Length (cm)	50	65	75
Weight (kg)	1	2	3
Rawmaterial/hour	1.320	2.640	3.960
Product/klst (η=40)	528	1.056	1.564
Product/klst (η=45)	594	1.188	1.782
Product/klst (η=48)	634	1.268	1.902
Product/klst (η=52)	686	1.372	2.058

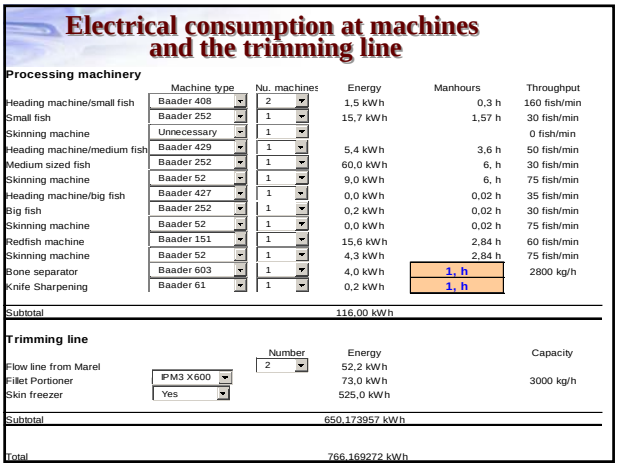
Orkuspar, The Energy Efficency Improvement Simulator

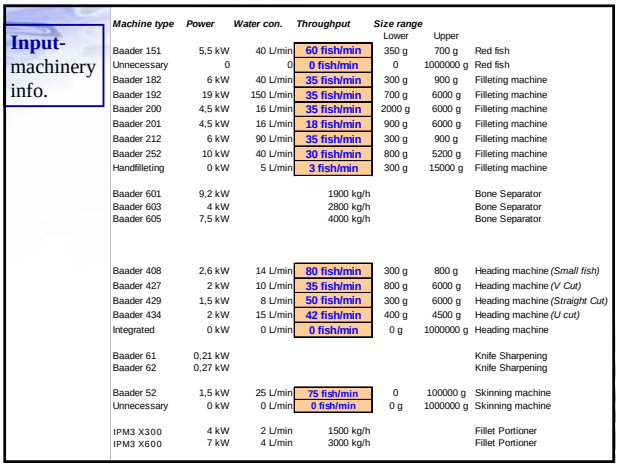
European Commission Project no: SAVE 4.1031/Z/00-029

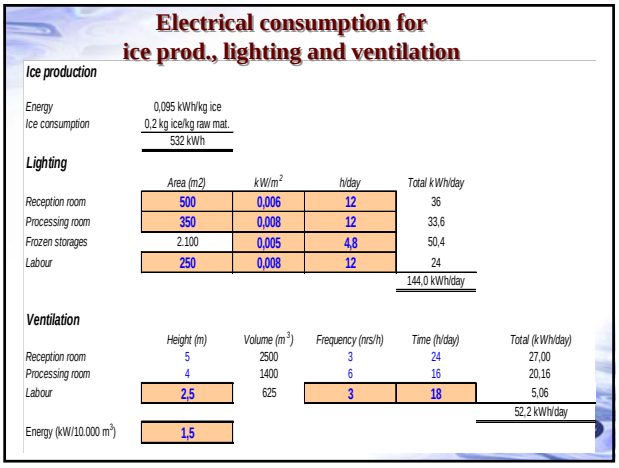
Meeting in Stockholm, 20.-21. January, 2003

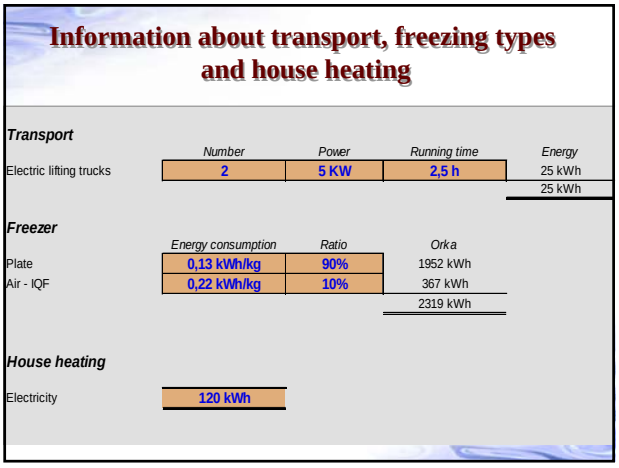












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ENERGI VISION
FISKERIVERKET
Vestlandsforsking
SVENSK energi
GRANDI
SKIPATÆKNI
Member of the Vik-Sandvik Group
TÆKNIHÁSKÓLI ÍSLANDS
Technical University of Iceland

Orkuspar, The Energy Efficency Improvement Simulator

European Commission Project no: SAVE 4.1031/Z/00-029

Meeting in Stockholm, 20.-21. January, 2003

Electrical consumption at frozen storage rums

Frozen store for products

	Height (m)	Width (m)	Length (m)	Volume (cubic m)
	5	20	35	3500
Area (m^2)	1950			

Out doors temp.	5 °C		
Indoors temp.	-24 °C	$k_{concrete}$	1,37 W/m°C
Thickness of the concrete wall	0,3 m	$k_{insulation}$	0,13 W/m°C
Thickness of the insulation	0,3 m	h1	100 W/m°C
		h2	4,5 W/m°C
Energy	491,9 kWh/dag		

Frozen store for day production

	Height (m)	Width (m)	Length (m)	Volume (cubic m)
	5	5	5	125
Area (m^2)	150			

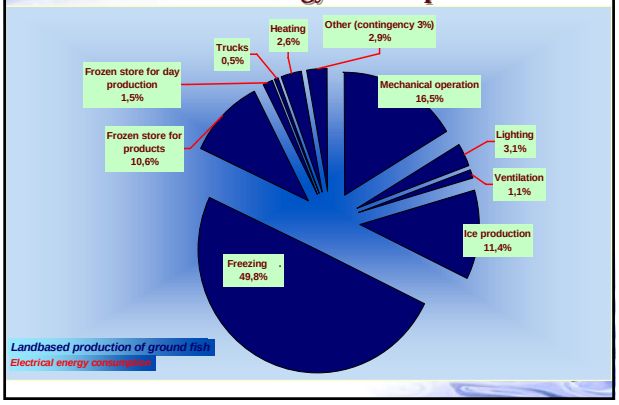
Out doors temp.	5 °C		
Indoors temp.	-24 °C	$k_{concrete}$	1,37 W/m°C
Thickness of the concrete wall	0,3 m	$k_{insulation}$	0,13 W/m°C
Thickness of the insulation	0,3 m	h1	4 W/m°C
Loading factor	100%	h2	4,5 W/m°C
Energy	69,6 kWh/day		

Landbased production of ground fish
Electrical energy consumption

Electric power	(kWh/day)	Ratio
Mechanical operation	766 kWh	16,46%
Lighting	144 kWh	3,09%
Ventilation	52 kWh	1,12%
Ice production	532 kWh	11,43%
Freezing .	2.319 kWh	49,81%
Frozen store for products	492 kWh	10,57%
Frozen store for day production	70 kWh	1,50%
Trucks	25 kWh	0,54%
Heating	120 kWh	2,58%
Other (contingency 3%)	136 kWh	2,91%
Total	4.656 kWh	100,00%

Energy consumption per kg of Raw material kWh/kg	0,133
Energy consumption per kg of Product kWh/kg	0,279

Landbased production of ground fish
Electrical energy consumption



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The Energy Efficiency Simulator

Phase 4
Trials and modification

Vestlandsforsking

ORKUSTOFNUN

ENERGI VISION

energi

SKIPATÆKNI

GRANDI

Orkuspar

- *Phase 4 Trials and modification*
  - Experimental runs of the software under real conditions. The project partners will carry out the testing in co-operation with end-users.
  - Copies of the simulator and relevant manuals will be made available to pre-selected end user group for try out.

Orkuspar

- Final thesis at TUI
- TUI / GRANDI / Skipatækni
- The developement

Orkuspar

- Test plan
- Deviation estimate
- Errors
- Functionality
- Modifications
- Handbook
- Appendices

Orkuspar

- Test plan
  - Deviations
  - Calculations
  - Program
  - Output
  - Functionality

Orkuspar

- Deviation estimate
  - Biggest deviation in input
  - Effect on results

TÆKNIHÁSKÓLI ÍSLANDS
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Orkuspar

	Deviation in input		Deviation in total fuel consumption	
	Min	Max	Min	Max
The fishing vessel				
Main engine	-0%	+4%	-0%	+4%
Vessel resistance	-8%	+8%	-2%	+2%
The fishing gear				
Trawl resistance	-0%	+10%	-0%	+5%
The fishing trip				
Weather and sea state	-40%	+40%	-5%	+5%
Catch rate	-15%	+15%	-2,5%	+2,5%
Other causes				
Human factor, and more	-2%	+2%	-2%	+2%
EES expected deviation			**-5%**	**+10%**

TÆKNIHÁSKÓLI ÍSLANDS
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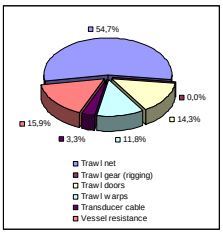
Orkuspar

- Total resistance to overcome trawling



TÆKNIHÁSKÓLI ÍSLANDS
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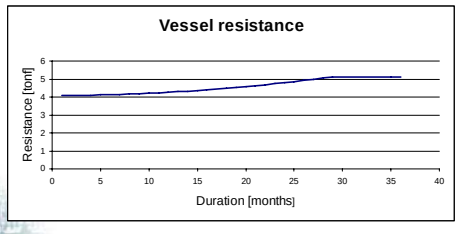
Orkuspar

- Errors
  - Input, calculations and output
  - Simulator

TÆKNIHÁSKÓLI ÍSLANDS
Technical University of Iceland

Orkuspar



TÆKNIHÁSKÓLI ÍSLANDS
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Orkuspar

- Functionality
  - Start menu commands

TÆKNIHÁSKÓLI ÍSLANDS
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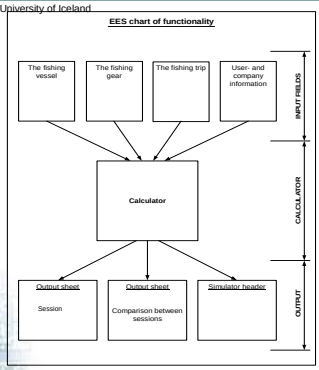
Orkuspar



- Changes
  - Proposed modifications due to errors
  - Additions / modifications

- Handbook
  - Functionality of the simulator
- Appendices

Table 3: Vessel information, item no. and input values for Þerney

No.	Items	Value
1.0	**Vessel information**	
100100	Vessel Name	Þerney RE-101
100200	Vessel ID No.	2203
100300	Vessel IMO No.	8901511
100400	Vessel Type	Stern trawler
100500	Vessel Main engine type	Wärtsila Wasa 6R 32E
100600	Vessel Auxilary engine type	Mercedes Benz OM 444A

Table 4: Changes to Box 6.2.

No.	Item.	Value.
6.2	**Fishing trip main data**	
620100	Fishing trip, number (NUtf)	1
⇓	⇓	⇓
620100	Fishing trip, name	Þerney 1/2002

Table 5: Changes to Box 6.3.

No.	Item.	Value.
6.3	**Catch and products**	
630100	Fishing trip, number (NUtf)	1
630200	Fishing gear in use	1
⇓	⇓	⇓
630100	Fishing gear in use	1
630200	Coefficient for fishing gear resistance	1,000

Table 6: Simulator header.

No.	Item.	Value.
10.1	**Simulator header**	
1010100	Vessel name:	L01
1010200	Vessel ID No:	L02
1010300	Trawl used:	L18
1010400	Trawl doors:	L19
1010500	Session No:	(active session) of (number of sessions loaded)
1010600	Trip name:	L12
1010700	Fishing ground:	L14
1010800	Fish species:	L16

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Improvement for better:

- Presentation of results
- Definition of functionality
- User interface

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- Orkuspar – version 1

	Before	After
Input (used cells)	98	112
Formulas	421	683
Output (tables and graphs)	4	31

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The future

- Developement of the simulator
- Additions
  - Help windows
  - Management model
  - (Data collection)

Orkuspar 02.02 -01.03

WNRI activities
by
Otto Andersen

Simulator specifications

- Adapting fishing vessel simulator specifications to cargo ships
- Guiding principle:
  - Treat cargo ships as fishing vessels, but without fishing gears
    - Simulator input specifications
    - Simulator output specifications

Decisions on:

- Base unit (one sailing trip: harbour to harbour)
- Simplifications
  - Exclude winches
  - Exclude the largest ships (oil tankers)
    - Still applicable for ships responsible for transporting about half of the total gross tonnage by Norwegian ships
    - Combination-ships, bulk carriers, freezing-ships, supply-ships, and other dry cargo ships

Questionnaires for obtaining cargo ship data

- Developing of questionnaires
- Sending out of questionnaires
  - Recipients:
    - DFDS
    - Maersk
    - Secco
    - Bergesen
    - Wilhelmsen
    - Høegh
    - Hual
    - Odfjell
    - Fred Olsen
    - Seatrans
    - United European Car Carriers

Database on Norwegian cargo ships

- All dry goods ships frequenting Norwegian ports, a total of 229 vessels.
- Included data: vessel name, gross tonnage, vessel type, speed, year built (vessel), main engine (type, kW and year built).

Appendix 2

Action plan

Action plan for ORKUSPAR- Energy Efficiency Improvement Simulator

Time period: 23.01.03-31.03.03			
	Partner	**Work**	**Deadline**
Phase 1, Data Collection			
Step 2, data collection	TI	Gather data from Eimskip regarding cargo ships	31.january 2003
	WNRI	Followup the questionnaries regarding data for cargo ships	31.january 2003
Phase 3, Simulator Development			
	EVI/SCIMUS	Correct errors and implement modifications	
	EVI/SCIMUS	Version 1 of Orkuspar simulator ready	15. March 2003
	IFL		
	TÍ		
	WNRI		
Phase 4, Trials and modification			
	IFL	Make the excel programme for the land based fishing industry available on the internet	Februar 2003
	TI	Try out the data on the excel programme for fishing ships as a model for cargo ships	28. February 2003
	WNRI	Try out the data on the excel programme for fishing ships as a model for cargo ships	28. February 2003
	EVI/SCIMUS	Make cost estimation for the modifications	31.January 2003
Phase 5, Dissemination			
	IFL	Plan and hold seminars with key persons in Iceland	March 2003
	TI	Plan and hold seminars with key persons in Iceland	March 2003
	OS	Plan and hold seminars with key persons in Iceland	March 2003
	WNRI	Plan and hold seminars with key persons in Norway	March 2003
	Fiskeriverket	Plan and hold seminars with key persons in Sweden	March 2003
	EVI	Plan and hold seminars with key persons in Sweden	March 2003
	Fiskeriverket	Send to IFL links of energy groups around Europe	February 2003
Phase 6, Project management			
	All	Fill out and sign cost statements and send to IFL	16. April 2003
	All	Write final report to the Commission	April 2003
	IFL	Send the cost statements and final report to the Commission	