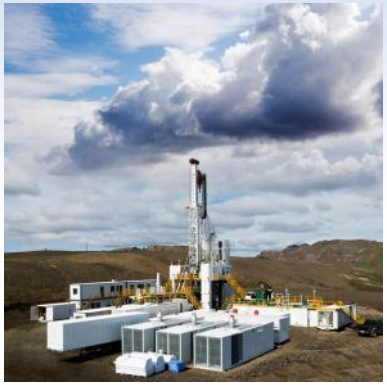
GEORG
GEOTHERMAL RESEARCH GROUP




May 20th, 2014

GEORG

6TH GENERAL ASSEMBLY 2014

GEORG PROJECT

GEORG ASSOCIATION

www.georg.hi.is

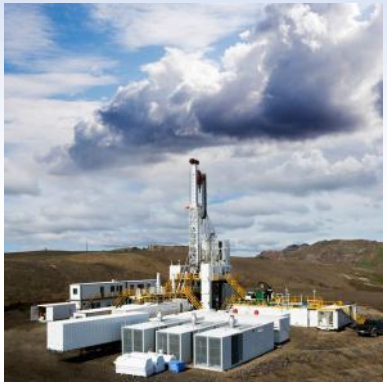
Election of chair of the meeting

- Sigurður Magnús Garðarsson- chair the meeting
- Hjalti Páll Ingólfsson, Operational Manager – take minutes

Agenda

- ***The annual report of GEORG for the past operating year***
- ***The annual accounts of GEORG Project***
- ***The annual accounts of GEORG Association***
- ***Determination of membership fees***
- ***Election of members of the Board of Directors***
- ***Any other business***

GEORG
GEOTHERMAL RESEARCH GROUP




Sigurður Magnús Garðarsson, Chairman of the Board

ANNUAL REPORT PRESENTATION

REPORT OF THE BOARD

What is GEORG?

International cluster cooperation

Founded 2009

Supported for 7 years by Vísinda og Tækniráð

RANNÍS

UNIVERSITY OF ICELAND

ORKUSTOFNUN

brgm

MarkMar

MANNVIT ENGINEERING

UPPSALA UNIVERSITET

GNS SCIENCE TE PŪ AO

Nýsköpunarmiðstöð Íslands

United Nations University

GFZ Helmholtz Centre Potsdam

matorka

HÁSKÓLINN Í REYKJAVÍK REYKJAVIK UNIVERSITY

Keilir Atlantic Center of Excellence

ICELAND SCHOOL OF ENERGY REYKJAVIK UNIVERSITY

BERKELEY LAB

CNRS

HS ORKA HF

VERKÍS

VATNASKIL CONSULTING ENGINEERS

Orkuveita Reykjavíkur

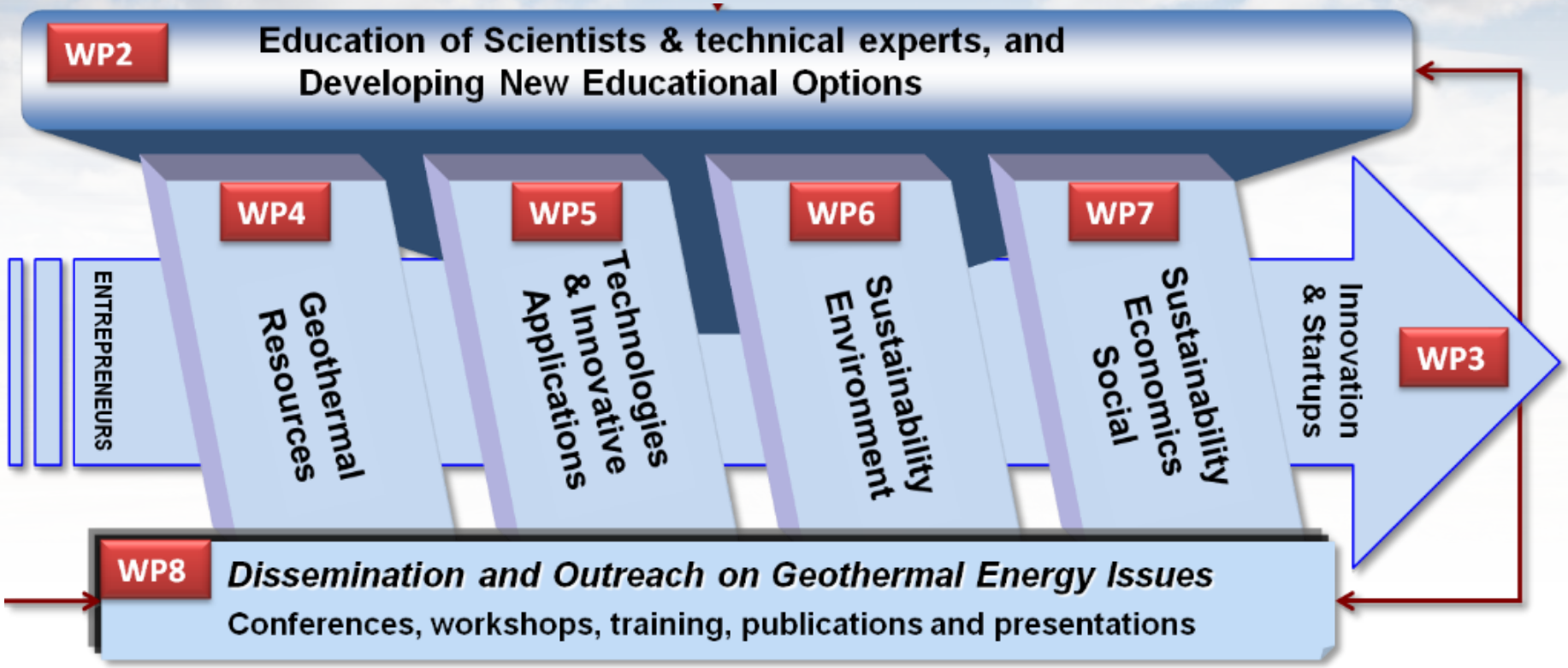
ÍSOR

CARBON RECYCLING INTERNATIONAL

Landsvirkjun

The four pillars

Structure


WP2
Education of Scientists & technical experts, and
Developing New Educational Options
WP4
Geothermal
Resources
WP5
Technologies
& Innovative
Applications
WP6
Sustainability
Environment
WP7
Sustainability
Economics
Social
ENTREPRENEURS
Innovation
& Startups
WP3
WP8
Dissemination and Outreach on Geothermal Energy Issues
Conferences, workshops, training, publications and presentations

What was achieved 2014-2015?

GEORG open house in November

Startup Energy Reykjavik
Cooperation signed
December 2013

Call for student travel support

DRG project launched

Cluster study trip to Norway in November

Launched 10th March 2014

Verkefnamidlun.is

GA 2013, may 16th

Call for student travel support

Geothermal speciation project signed

31.3 2014

1.4.2013

From Waste to Value W2V

Seminar series

Geothermal ERA-NET

Meeting in Budapest in September 2013

GeoDirect – Connection to Lithuania
Study trip in October in cooperation with IG

Geothermal ERA-NET

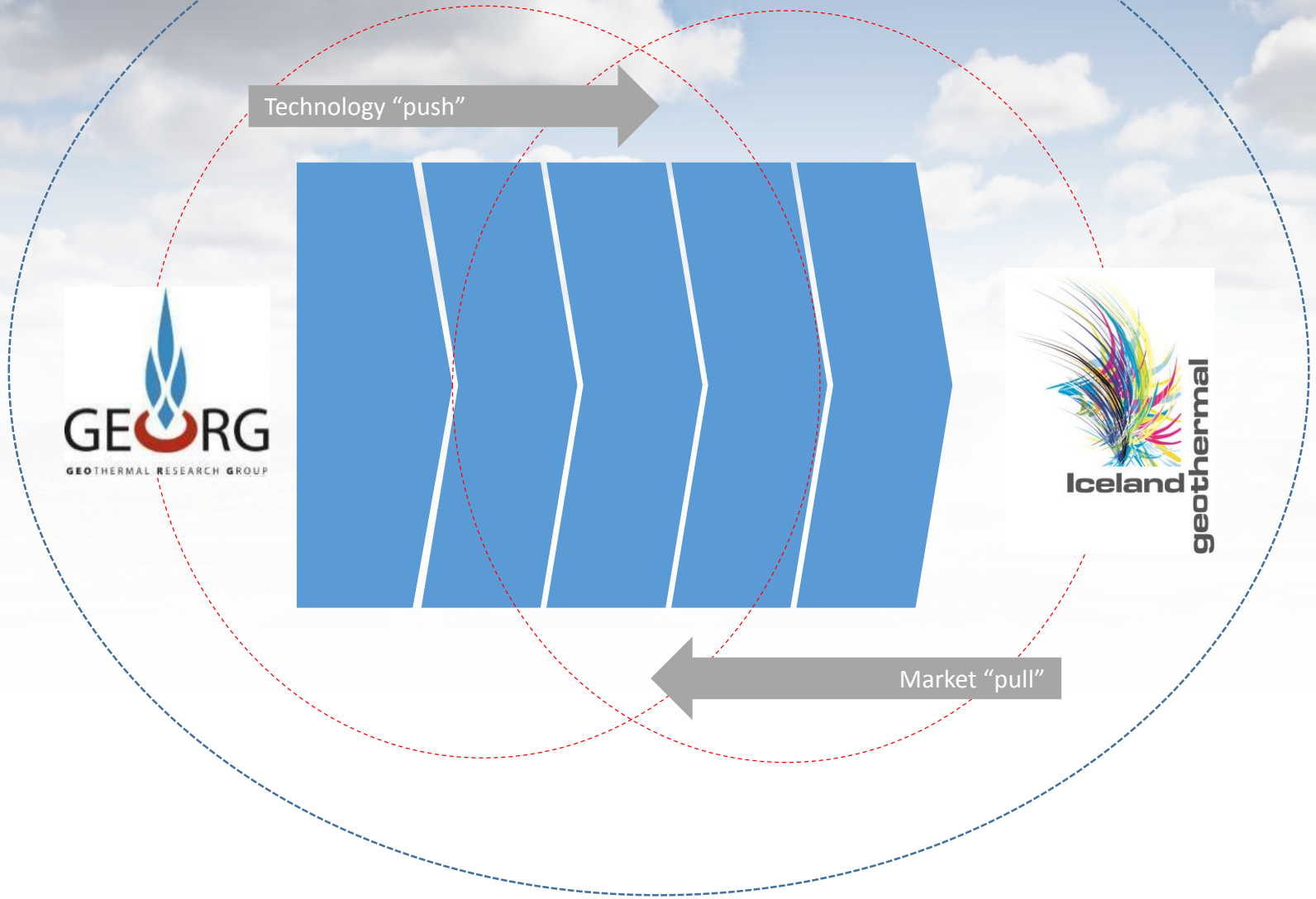
Meeting in Swiss in March 2014

From Waste to Value W2V

Project definition workshop

Icelandic Geothermal cluster

Research driven – Industrial driven



Collaboration of GEORG projects

22 projects supported by GEORG

Lubrication

International collaborations

Ten of the supported project involve cooperation between Icelandic and international research teams

Collaboration of GEORG projects

22 projects supported by GEORG

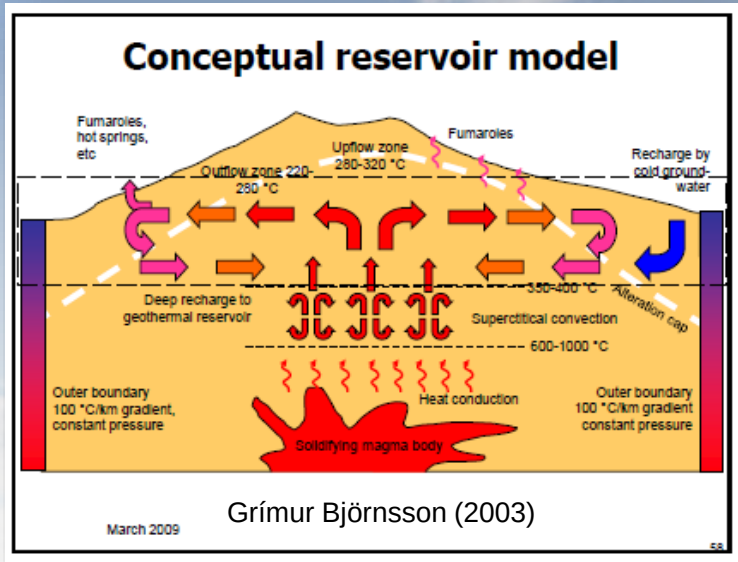
- **Projects in reservoir modelling and simulation** DRG
  - Development of software and algorithm
  - Mapping and analysis of subsurface data (3D)
  - Methods to estimate sustainability of systems
  - Seismicity research
- **High pressure / high temperature fluids**
  - Researches on two phase flow of fluids in porous media
  - Utilisation of super critical fluids
  - Development of high pressure and high temperature grouts for boreholes
- **Environmental impact**
  - CO2 sequestration
  - Reduction of emission by using biochemical
  - The sustainability of geothermal utilization: sustainability indicator for geothermal utilization
  - Evaluating the cost of environmental impact due to geothermal utilization
  - H2S sequestration into geothermal systems
  - Application of geothermal heat in aquaculture and building an ecological food park
- **Miscellaneous**
  - Geothermal economical database
  - Efficient Maintenance Management of Geothermal Power Plants

Lubrication

Heat extraction from magma in the roots of geothermal systems

Permeable reservoir heated from below

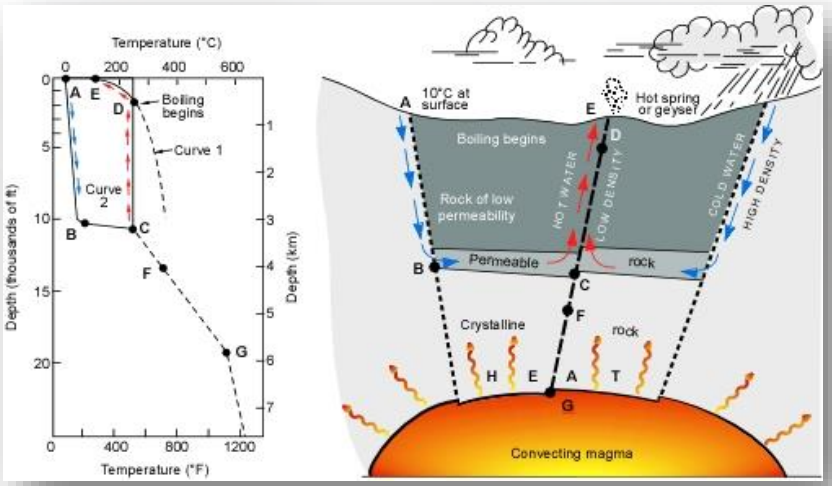
Sometimes two levels - including supercritical convection above a magma body – the ultimate source of heat



Grímur Björnsson (2003)

Fundamental questions addressed by GEORG:

- **What is the nature of the heat sources?**
- **How deep are they?**
- **How long do they last as providers of thermal energy?**
- **How can the monstrous energy be tamed**



Collaboration of GEORG projects

22 projects supported by GEORG

- **Projects in reservoir modelling and simulation**
  - Development of software and algorithm
  - Mapping and analysis of subsurface data (3D)
  - Methods to estimate sustainability of systems
  - Seismicity research
- **High pressure / high temperature fluids**
  - Researches on two phase flow of fluids in porous media
  - Utilisation of super critical fluids
  - Development of high pressure and high temperature grouts for boreholes
- **Environmental impact**
  - CO_2 sequestration
  - Reduction of emission by using biochemical
  - The sustainability of geothermal utilization: sustainability indicator for geothermal utilization
  - Evaluating the cost of environmental impact due to geothermal utilization
  - H_2S sequestration into geothermal systems
  - Application of geothermal heat in aquaculture and building an ecological food park
- **Miscellaneous**
  - Geothermal economical database
  - Efficient Maintenance Management of Geothermal Power Plants

W2V

Lubrication

Joint effort

From Waste to Value

W2V

- added value and economical solutions
  - Explore possible opportunities of cooperation on research projects within GEORG
  - With the aim of converting

Waste to Value (W2V)

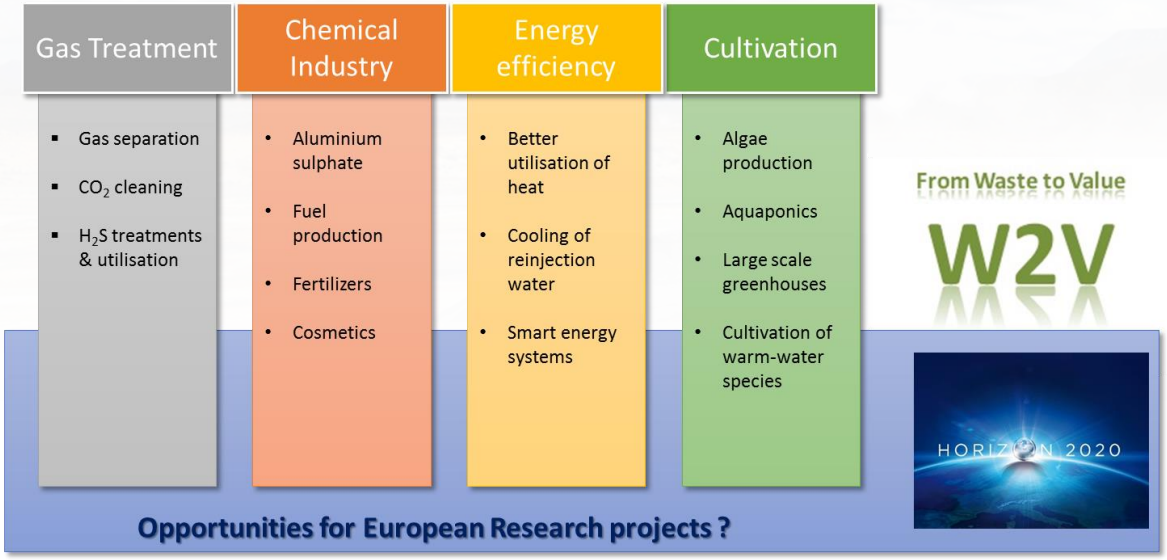
GEORG

From Waste to Value

W2V

Project ideas to be explored further

Methane gas production from geothermal gases
Mapping of opportunities in utilizing geothermal energy and chemicals in chemical industry
Continues monitoring of chemical properties of geothermal waste gas from geothermal power plants
Utilization of geothermal heat in aquaponics
Capturing and utilizing of silica from geothermal power plants streams.



Some actions can be expected as early as this summer!!

Preparation paper-studies and students summer-projects

Business accelerator
Startup Energy Reykjavik (SER)

7 carefully selected teams,
each team gets 5MISK in seed funding

Startup Energy Reykjavik

Arion banki

Landsvirkjun

klak Nýsköpunarmiðstöð

innovit Nýsköpunar- og frumkvöðlasetur

Iceland geothermal

Nýsköpunarmiðstöð Íslands

GEORG

www.startupenergy.com

GEORG contribution to SER = **10MISK**

And a lot more….!

Geothermal ERA-NET

Application prepared by Iceland Geothermal
The bid book presented at IGA BoD meeting, Manila, March 21st 2014

Results expected in June – July 2014

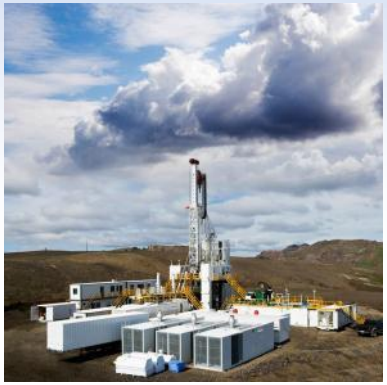
Geothermal speciation project signed

Cooperation with the Ocean Cluster and Iceland Geothermal

Horizon 2020 „stimulation“ planned in Sept – Oct in cooperation with Iceland Geothermal and Rannis

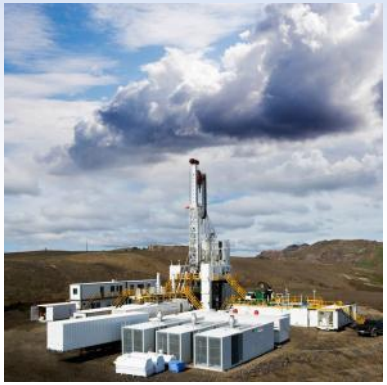
GEORG

GEOTHERMAL RESEARCH GROUP



DISCUSSION ON ANNUAL REPORT

GEORG
GEOTHERMAL RESEARCH GROUP



Hjalti Páll Ingólfsson, Operational Manager

ANNUAL ACCOUNTS

GEORG Project

GEORG Project- Cost and financing account

		Year 5		
Cost	**Note**	**GEORG**	**Partners**	**Total**
Grants	1	68.638	308.299	376.937
Contracted services	2	171		171
Travel expenses		130		130
Conferences, dissem. & outreach	3	0	0	0
Overhead total	4	11.096	2.000	13.096
Total operation cost		**80.035**	**310.299**	**390.335**
Financing				
Partner Co-financing		0	310.299	310.299
Funding from Rannis	5	126.000		126.000
Total financing		**126.000**	**310.299**	**436.299**
Results of operational activities		**45.965**	**0**	**45.965**
Transferred between years				
Unpaid funding from Rannís		14.000		
Acquired funding from last year		-70.000		
Other receivables		0		
Allocated but unpaid grants to R&D projects		-117.610		
Allocated grants to R&D projects last year		89.185		
Other short term liabilities from last year		0		
Final results of the year		**-38.460**	**0**	**-38.460**

The accounts were approved by Sveinbjörn Sveinbjörnsson at Íslenskir Endurskoðendur slf.

ÍSLENSKIR ENDURSKOÐENDUR

GEORG Project

GEORG Project - Balance sheet

Assets	Note	Year 5 31. March 2014
Cash and cash equivalents	6	85.909
Unpaid funding from Rannís	5	14.000
Other receivables	7	0
Total assets		**99.909**
Debts and liabilities		
Unpaid grants for projects	8	117.610
Other short term liabilities	1	0
Total debts and liabilities		**117.610**
Balance at beginning of period		20.792
Final results of the year		-38.493
Total assets		**-17.701**

The accounts were approved by Sveinbjörn Sveinbjörnsson at Íslenskir Endurskoðendur slf.

ÍSLENSKIR ENDURSKOÐENDUR

GEORG Association

STATEMENT OF ACTIVITIES 1.4.2013-31.3.2014

	Note	1.4.2013-31.3.2014	1.4.2012 31.3.2013
Revenues			
Operational grants		21.325.865	1.981.443
		21.325.865	1.981.443
Expenses			
Grants awarded		19.957.375	670.000
Other expenses		1.646.849	1.293.573
		21.604.224	1.963.573
Financial income and (expenses)			
Interest revenues and exchange differences		373.264	1.243
Financial income taxes		(74.652)	(248)
Bank related service fees		(20.253)	(18.865)
		278.359	(17.870)
Excess of revenues over expenditures		0	0

The accounts were approved by Sveinbjörn Sveinbjörnsson at Íslenskir Endurskoðendur slf.

ÍSLENSKIR ENDURSKOÐENDUR

GEORG Association

Statement of Financial Position

Assets

	Note	31.3.2014	31.3.2013
Current assets			
Receivables:			
Accounts receivable		6.411.965	0
Cash and cash equivalents		17.363.478	1.886.417
Current assets		23.775.443	1.886.417
Total assets		23.775.443	1.886.417

The accounts were approved by Sveinbjörn Sveinbjörnsson at Íslenskir Endurskoðendur slf.

ÍSLENSKIR ENDURSKOÐENDUR

GEORG Association

Equity and Liabilities

	Note	31.3.2014	31.3.2013
Net assets			
Permanently restricted		0	0
Temporarily restricted		0	0
Unrestricted		0	0
Total net assets	3	0	0
Current liabilities			
Deferred income		21.147.734	1.538.967
Accounts payable		2.627.709	347.450
Total liabilities		23.775.443	1.886.417
Total net assets and liabilities		23.775.443	1.886.417

The accounts were approved by Sveinbjörn Sveinbjörnsson at Íslenskir Endurskoðendur slf.

ÍSLENSKIR ENDURSKOÐENDUR

Auditor's Compilation Report

To the board of directors of GEORG-Rannsóknarklasi í jarðhita.

We have compiled, on the basis of the information provided by management, in accordance with the International Standard ISRS 4410, these financial statements of GEORG-Rannsóknarklasi í jarðhita as of March 31, 2014 and statement of income and cash flows for the year then ended.

We have not performed an audited or reviewed these financial statements and accordingly we express no assurance thereon.

Reykjavík, May 14, 2014

Sveinbjörn Sveinbjörnsson
löggiltur endurskoðandi

Íslenskir endurskoðendur Bíldshöfða slf
Bíldshöfða 14, 110 Reykjavík

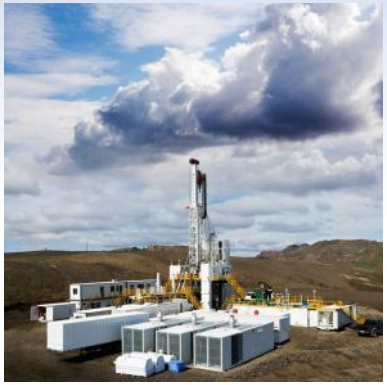
Operational plan

	MISK
Rannis total grant	490,0
Already allocated through calls	276,0
DRG project (WP4)	33,0
Startup Energy Reykjavik	10,0
WGC2020 application	2,0
Operational cost (first 5Y)	51,0
Still to be allocated	**118,0**
Minimum operational cost for Y6 -Y7 + 1 additional year (12MISK x 3 years)	**36,0**
Total budget left for research	82,0
-> on yearly basis	**41,0**

	2014-2015 Y6	2015-2016 Y7	Total
W2V	10,0	10,0	**20,0**
Data management, economic and social activities (WP7)	10,0	10,0	**20,0**
Innovation efforts (WP3&WP5)	10,0	10,0	**20,0**
Increased visibility (WP2 & WP8)	2,0	2,0	**4,0**
Improved services (all WP's)	4,0	4,0	**8,0**
To be determined later	5,0	5,0	**10,0**
Total	**41,0**	**41,0**	**82,0**

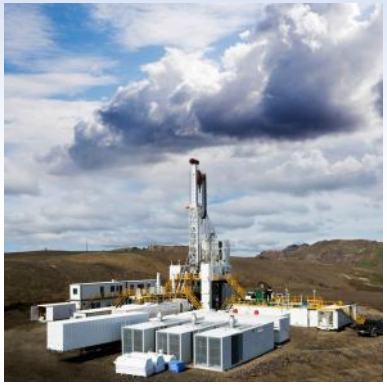
GEORG

GEOTHERMAL RESEARCH GROUP



DISCUSSION ON ANNUAL ACCOUNTS

GEORG
GEOTHERMAL RESEARCH GROUP

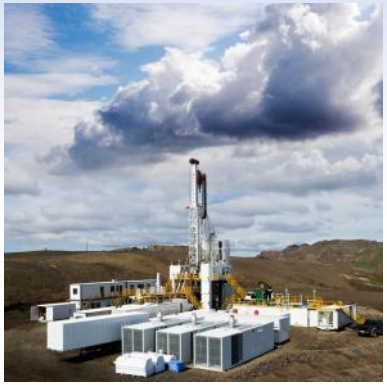


DETERMINATION ON MEMBERSHIP FEES

Decision on Membership Fees

- The BoD proposes that the membership fee continues to be 0

GEORG
GEOTHERMAL RESEARCH GROUP



ELECTIONS

Election of Board of Directors

Seats open for election

Icelandic Universities, research institutions and governmental agencies – 5 BoD seats	Energy companies – 1 BoD seat	Private companies– 1 BoD seat	Other EEA based participating collaborators and Associate members – 1 BoD seat
Sigurður Magnús Garðarsson			
Magnús Tumi Guðmundsson	Guðmundur Ómar Friðleifsson	Auður Andrésdóttir	Ernst Huenges
Einar Jón Ásbjörnsson			
Rúnar Unnþórsson			
Steinunn Hauksdóttir			

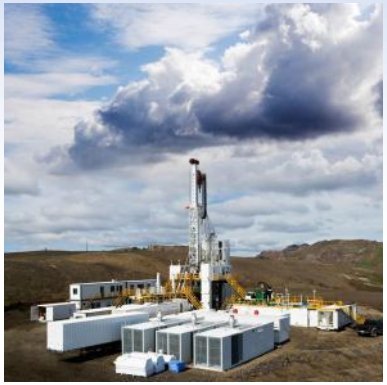
BoD propose the following:

- Bjarni Pálsson LV to replace Guðmundur Ómar Friðleifsson HS Orka
- Oddur B Björnsson Verkis to replace Auður Andrésdóttir Mannvit
- Magnús Tumi Guðmundsson and Rúnar Unnþórsson continue

The Board proposes that following individuals be re-elected to the Science Academy:

Name	Position	Name	Position
Sveinbjörn Björnsson	Chair		
Brynhildur Davíðsdóttir	UNI	**María S Guðjónsdóttir**	UNU GTP
Árný Erla Sveinbjörnsdóttir	UNI	**Guðni A Jóhannesson**	OS
Guðni Axelsson	ISOR	**Einar Gunnlaugsson**	OR
Halldór Pálsson	UNI	**Kristinn Ingason**	Mannvit
David Mainprice	CNRS	**David Bruhn**	GFZ
Hrefna Kristmannsdóttir	Independent	**Ingólfur Örn Þorbjörnsson**	ISOR
Ólafur Guðmundsson	Uppsala University	**Sæunn Halldórsdóttir**	ISOR
Sunna Wallevik	**ICI**	**Ágúst Valfells**	**RU**

GEORG
GEOTHERMAL RESEARCH GROUP



OTHER MATTERS

The General Assembly is concluded