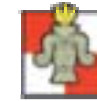


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Review of GSEEE 2009 - 2010  
Summer seminar 18.-19.8.2010  
Päiväranta, Imatra

Prof. Juha Pyrhönen, LUT

# GRADUATE SCHOOL IN ELECTRICAL ENERGY ENGINEERING (GSEEE)



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Aalto-yliopisto

TAMPEREEN TEKNILLINEN YLIOPISTO

VAASAN YLIOPISTO

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## What has happened during 2009 – 2010

- 12 Doctors of Science graduated from the GSEEE in 2009
- 2010 the speed is good, so far we have already 8 public defenses
- International activities are also growing
- Our previous application for the Academy of Finland was successful. Now there is, again, another application round, which brings its new challenges with it.
- The Graduate School organizational system will change. Our GSEEE will be changed to the Doctoral Program in EEE (DPEEE) and there is only one GS at LUT where Aalto, TUT, UV and VTT will join as agreed. This change should not have an effect on the students' positions

# GRADUATE SCHOOL IN ELECTRICAL ENERGY ENGINEERING (GSEEE)

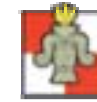
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VAASAN YLIOPISTO



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## What has happened during 2009 – 2010

- Dr. Pia Lindh has just returned from her parental off-time period
- We thank Dr. Samuli Honkapuro for his excellent work as a deputy and Pia will continue in the autumn



# GRADUATE SCHOOL IN ELECTRICAL ENERGY ENGINEERING (GSEEE)



## Graduated doctors annually

\*)Situation in 16.8.2010

	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10*	95-09	
LUT	1	0	0	2	3	2	1	1	5	5	5	4	4	4	5	4	<b>46</b>	LUT
Aalto	1	1	0	4	1	2	5	4	3	6	7	7	6	10	5	3	<b>65</b>	Aalto
TUT	0	1	1	1	0	0	1	3	2	0	1	1	4	2	2	1	<b>20</b>	TUT
Tot.	2	2	1	7	4	4	7	8	10	11	13	12	14	16	12	8	<b>131</b>	Yht

## Graduated doctors from OPM positions

Number of OPM position holders (all time total)

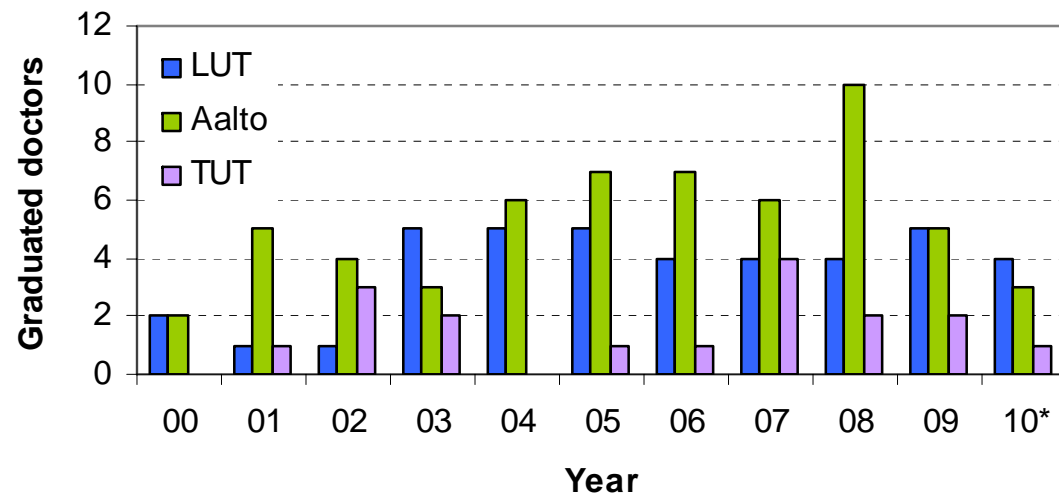
Percentage of graduated OPM position holders (%)

	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10*	95-09			
LUT	0	0	0	0	2	2	0	1	2	2	4	1	1	1	1	1	<b>18</b>	LUT	23	<b>78</b>
Aalto	0	1	0	2	0	1	1	2	3	2	3	2	1	2	1	2	<b>23</b>	Aalto	31	<b>74</b>
TUT	0	0	1	0	0	0	1	1	1	0	1	1	1	2	0	1	<b>10</b>	TUT	19	<b>53</b>
VY														0	0	0	<b>0</b>	VY	1	<b>0</b>
Tot.	0	1	1	2	2	3	2	4	6	4	8	4	3	5	2	4	<b>51</b>	Tot.	74	<b>69</b>

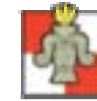
## Age of graduated doctors in 2006-2009

	aver.	median
OPM	31,7	29,5
Others	34,9	32,0
All	33,9	30,5

In year 2009	aver.	median
	36,4	32



# GRADUATE SCHOOL IN ELECTRICAL ENERGY ENGINEERING (GSEEE)

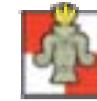


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## Dissertations during 2009, 12 in total

Pramod Bhusal, 33 v.	16.1.2009	<i>Valaistustekniikka</i> <u>Energy-efficient Electric Lighting</u> for Buildings in Developed and Developing Countries	TKK/Halonen
Juha Turunen, 30 v.	22.5.2009	<i>Tehoelektroniikka</i> Series <u>Active Power Filter</u> in Power Conditioning	TTY/Tuusa H.
Ville Särkimäki, 30 v.	28.5.2009	<i>Kunnossapitotekniikka</i> Radio frequency measurement method for <u>detecting bearing currents</u> in induction motors	LUT/Ahola J.
Sami Petterson, 30 v.	29.5.2009	<i>Tehoelektroniikka</i> Comparative Study of Microcontroller Controlled Four-Wire Voltage and Current Source Shunt <u>Active Power Filters</u>	TTY/Tuusa H.
Janne Roivainen, 42 v.	26.6.2009	<i>Sähkömekaniikka</i> Unit-wave response-based modeling of electromechanical noise and vibration of <u>electrical machines</u>	TKK/Arkkio A.
Matti Multimäki, 75 v.	14.8.2009	<i>Sähkömekaniikka</i> Standardin ISO 9001 eräs tulkinta “miten osuudesta”: <u>Miksi standardi ISO 9001 ei</u> anna odotettua tulosta?	TKK/Arkkio A.

# GRADUATE SCHOOL IN ELECTRICAL ENERGY ENGINEERING (GSEEE)

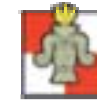


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## Dissertations during 2009, 12 in total

Antti Laiho, 32 v.	18.9.2009	<i>Sähkömekaniikka</i> Electromechanical modelling and active control of flexural rotor vibration in cage rotor electrical machines	TKK/Arkkio
Valentin Dzankhotov, 32 v.	23.10.2009	<i>Sähkökäytöt</i> Hybrid LC Filter for Power Electronic Drives: Theory and Implementation	LUT/Pyrhönen J.
Konstantin Kostov, 41 v.	27.11.2009	<i>Tehoelektroniikka</i> Design and Characterization of Single-Phase Power Filters	TKK/Kyyrä
Juha Ström, 28 v.	17.12.2009	<i>Sovellettu elektroniikka</i> Active du/dt Filtering for Variable-Speed AC Drives	LUT/Silventoinen
Jukka Lassila, 34 v.	19.12.2009	<i>Sähköverkot</i> Strategic Development of Electricity Distribution Networks – Concept and Methods	LUT/Partanen
Hanne Jussila, 29 v.	21.12.2009	<i>Sähkökäytöt</i> Concentrated Winding Multiphase Permanent Magnet Machine Design and Electromagnetic Properties – Case Axial Flux Machine	LUT/Pyrhönen J.

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**Dissertations during 2009, 12 in total**

**Filtering (PE) 5**

Machine vibration and noise 2

Machine Bearing currents 1

Lighting 1

Distribution Network Development 1

PM machine design 1

Standardization 1

(Machines in general, 4 in total)

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## Dissertations in 2010 (status on 16.8.2010), 8 in total so far

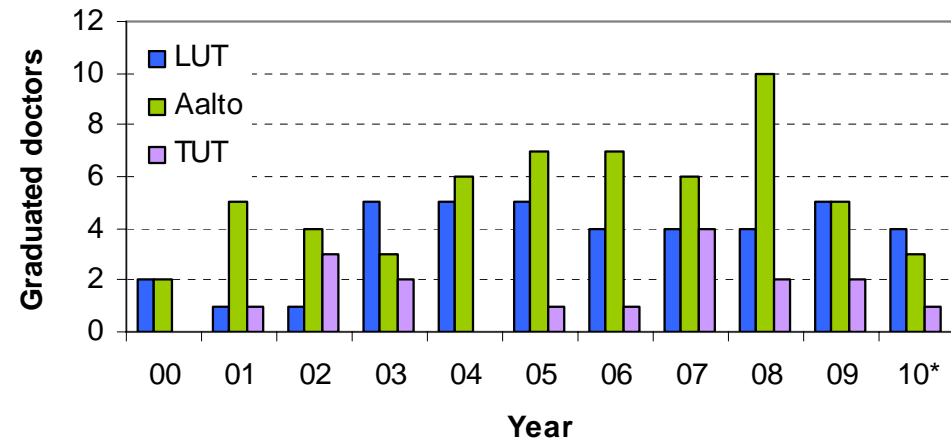
Mohammad Jahirul Islam, 32 v.	4.1.2010	Finite-element analysis of eddy currents in the form-wound multi-conductor windings of electrical machines	Aalto/Arkkio
Jouni Pylvänäinen, 32 v.	5.2.2010	Reliability Analysis for Distribution Networks Combined with Transformer Condition Assessment	TTY/Verho
Kaisa Tahvanainen, 29 v.	19.3.2010	Managing regulatory risks when outsourcing network-related services in the electricity distribution sector	LUT/Partanen
Aleksanteri Ekrias, 28 v.	4.6.2010	Development and enhancement of road lighting principles	Aalto/Halonen
Ville Naumanen, 29 v.	7.6.2010	Multilevel Converter Modulation: Implementation and Analysis	LUT/Pyrhönen
Toni Itkonen, 31 v.	21.6.2010	Parallel Operating Three-phase Voltage Source Inverters – Circulation Current Modeling, Analysis and Mitigation	LUT/Silventoinen
Zlatko Kolondzovski, 32 v.	6.8.2010	Thermal and Mechanical Analyses of High-Speed Permanent-Magnet Electrical Machines	Aalto/Arkkio
Risto Tiainen, 29 v.	13.8.2010	Utilization of a Time Domain Simulator in the Technical and Economic Analysis of a Wind Turbine Electric Drive Train	LUT/Ahola

# GRADUATE SCHOOL IN ELECTRICAL ENERGY ENGINEERING (GSEEE)



## Graduated doctors

- So far (status on 16.8.2010) 131 doctors in total have graduated from the GSEEE (as 74 is the total number of OPM/OKM positions the throughput is 177 %)
- All graduated doctors of the GSEEE are working in challenging jobs corresponding to their educations
- More than half of the graduated work in the industry. This has also been the target of the augmented doctoral education in electrical engineering. The GSEEE has significantly improved the situation in Finland in its field of research and education



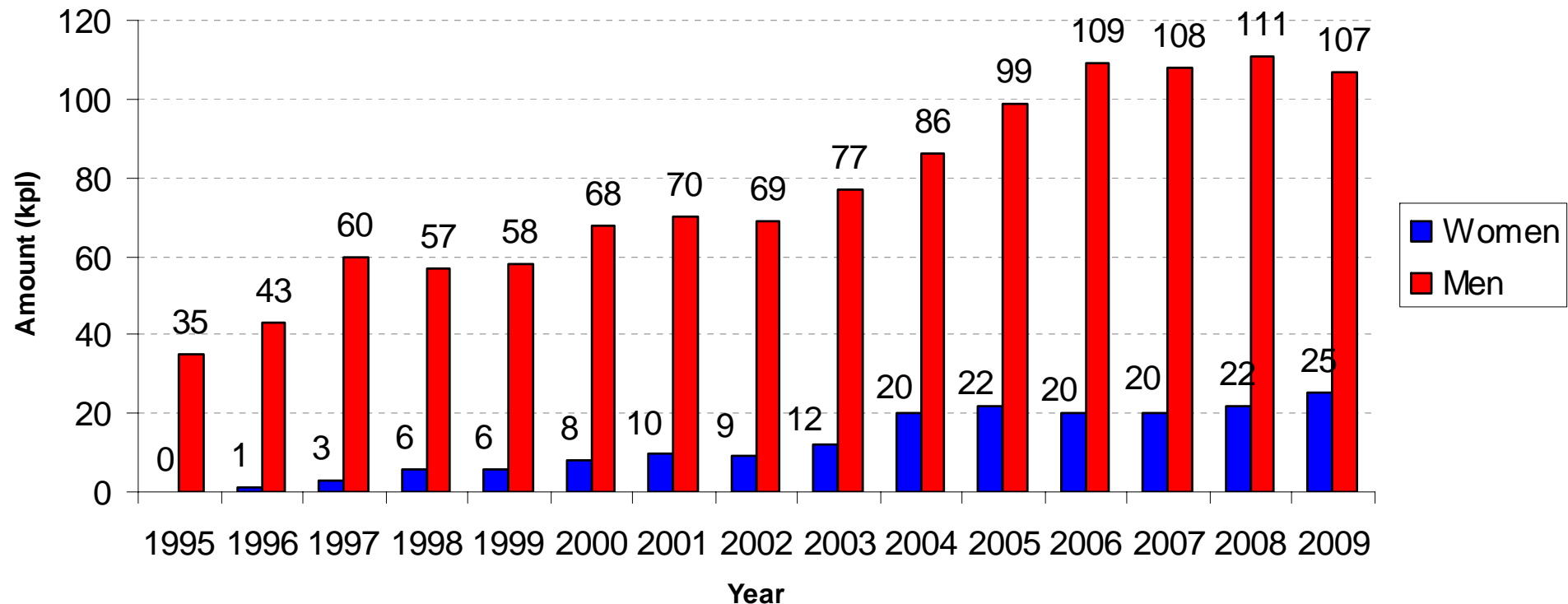
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## Post graduate students in GSEEE during 1995 – 2009



The average amount of students during the latest five years is 128.6. As the output of the GSEEE during the same time has been 13.4 in average it results in 9.5 years of average graduation time which is far too much → passive register?

# GRADUATE SCHOOL IN ELECTRICAL ENERGY ENGINEERING (GSEEE)



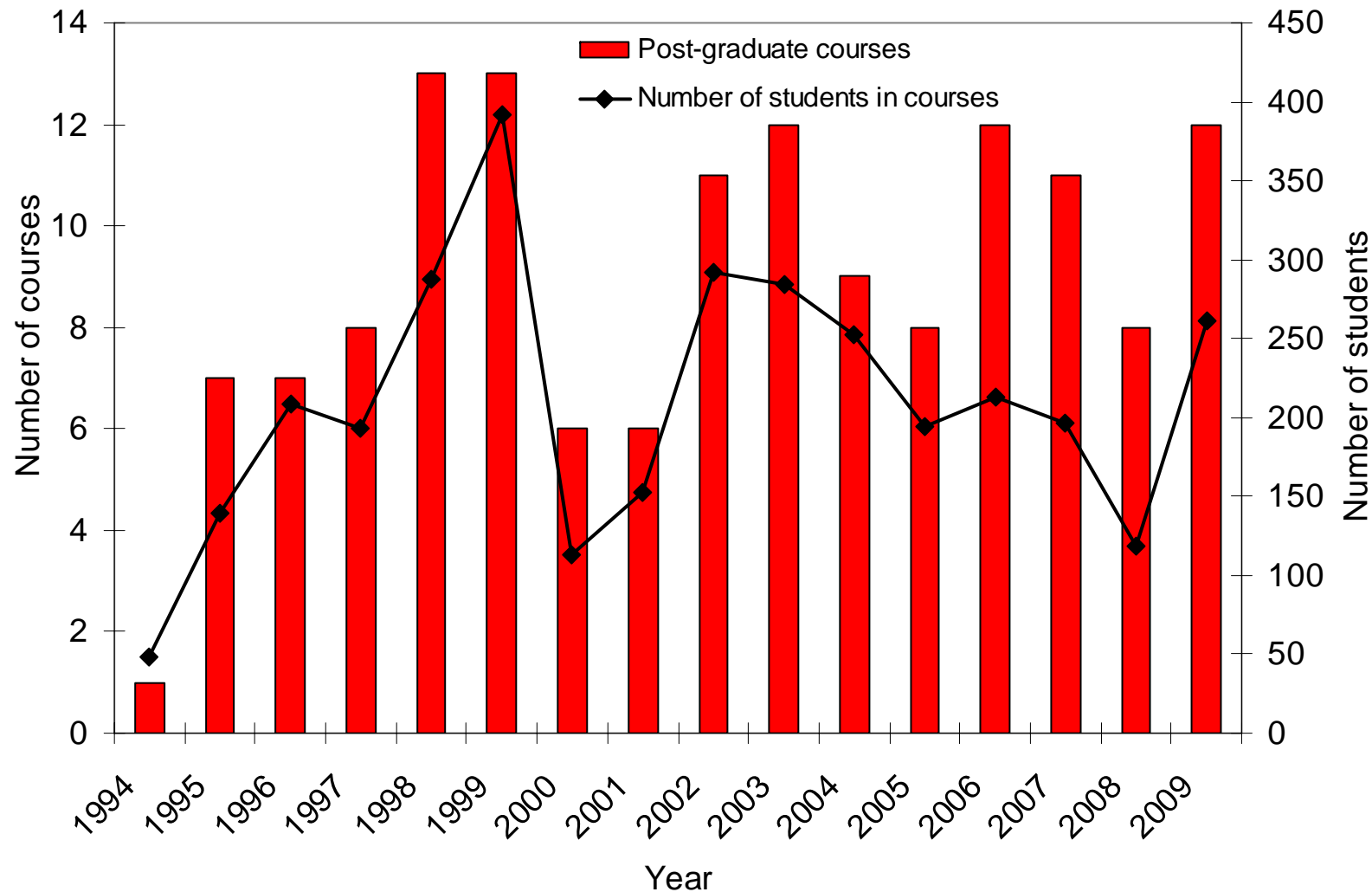
TAMPEREEN TEKNILLINEN YLIOPISTO



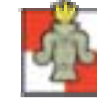
VAASAN YLIOPISTO



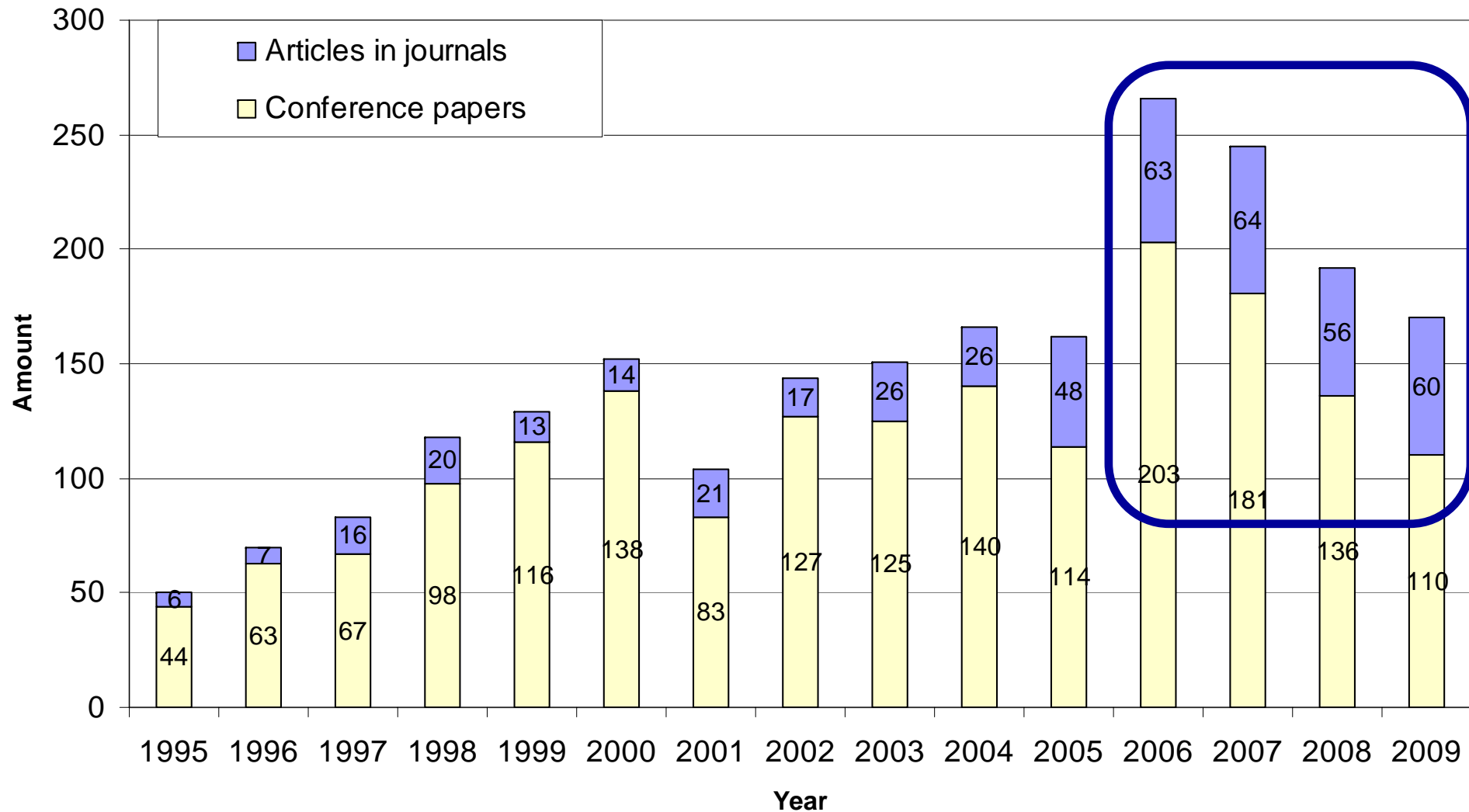
## Post graduate courses and students attending during 1995 – 2009



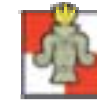
# GRADUATE SCHOOL IN ELECTRICAL ENERGY ENGINEERING (GSEEE)



Publication activities 1995 – 2009, conference and journal papers



# GRADUATE SCHOOL IN ELECTRICAL ENERGY ENGINEERING (GSEEE)



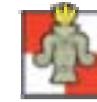
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## New Academy application round for Graduate Schools

- Graduate schools apply for funding for new four year periods. The applications are arranged every two years
  - Financing for OKM-researcher positions and operational costs (courses, seminars, internationalization)
- As **criteria** among others are: **need of doctors** in the field, **employment** of the graduated, **scientific results** and **international activities** of the GS
  - For example: Dissertations, publications, researcher exchange activities etc.
- GSEEE succeeded well in the application round of 2008 (decision was published in February 2009)
  - Total amount of post graduate positions since the beginning of 2010 is 19 (earlier 14)
- New application round is running and the application will be finished soon. This time there are no extra vacancies available from OKM and we have to compete to maintain our position

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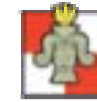


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## OKM-researcher positions

- GSEEE now has 19 vacancies for post graduate students financed by the OKM
- Each year vacancies open after graduation of the previous student
- Internal applications in October-November, this year five vacancies will open
- The vacancies are allocated according to applications for 1-4 years depending on the phase of studies of the applicant
- The GSEEE OKM position guarantees the basic funding for the student (normally extra funding is got from industrial projects)
- We shall announce this year's application round in October
- Every post graduate student should apply

# GRADUATE SCHOOL IN ELECTRICAL ENERGY ENGINEERING (GSEEE)

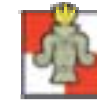


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## Summary

- GSEEE has been fairly successful → good results for the previous applications → Fairly good resources
- To be successful also in the future the quality and results of the GSEEE must be high
- Please do research, **do publish in international journals with impact factors**, do become more international, do defend your theses successfully...
- ... and at the moment **please have a nice time in the summer seminar.**

# GRADUATE SCHOOL IN ELECTRICAL ENERGY ENGINEERING (GSEEE)



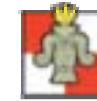
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## Program of the seminar, Wednesday 18.8.2010

12.00 – 13.00	Check-in and lunch
13.00 – 13.30	Annual review of GSEEE <i>Juha Pyrhönen</i>
13.30 – 13.45	GSEEE FiDiPro Fellowship in Permanent Magnet Machines <i>Dr. Juan Antonio Tapia</i>
13.45 – 15.15	GSEEE research relating to electrical transportation <i>Presentations of the GSEEE research units</i> <i>Discussions</i>
15.15 – 15.30	Coffee break
15.30 – 17.00	Workshop in small groups
17.00 – 18.00	Dinner
18.30 – 21.00	Evening program
21.00 –	Sauna and evening snack

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## Program of the seminar, Thursday 19.8.2010

8.00 – 9.00	Breakfast
9.00 – 9.30	Possibilities and impacts of the electric vehicles <i>Nils-Olof Nylund, VTT</i>
9.30 – 10.00	Battery technology of the electric vehicles <i>Martti Alatalo, European Batteries</i>
10.00 – 10.15	Coffee break
10.15 – 10.45	Influences of the electric vehicles on power production and electricity distribution in Finland, <i>Jarmo Partanen, LUT Energy</i>
10.45 – 11.15	Development and research challenges of the electric vehicles in Finland, <i>Markus Hirvonen, Valmet Automotive</i>
11.15 – 12.00	Discussions
12.00 –	Lunch and departure