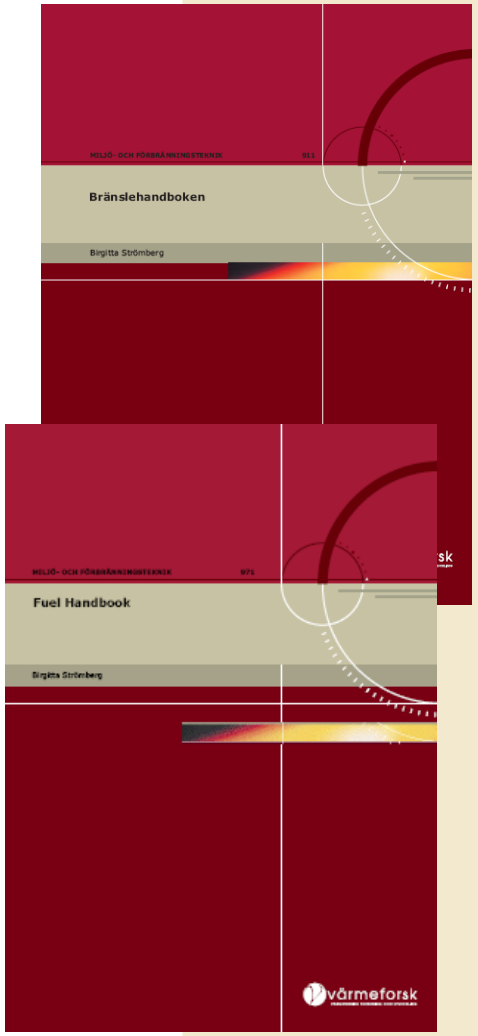
Bränslehandboken – Fuel Handbook

How to introduce new varieties of bio-fuels in your plant



tps Branschforskning

FACTS

About Värmeforsk

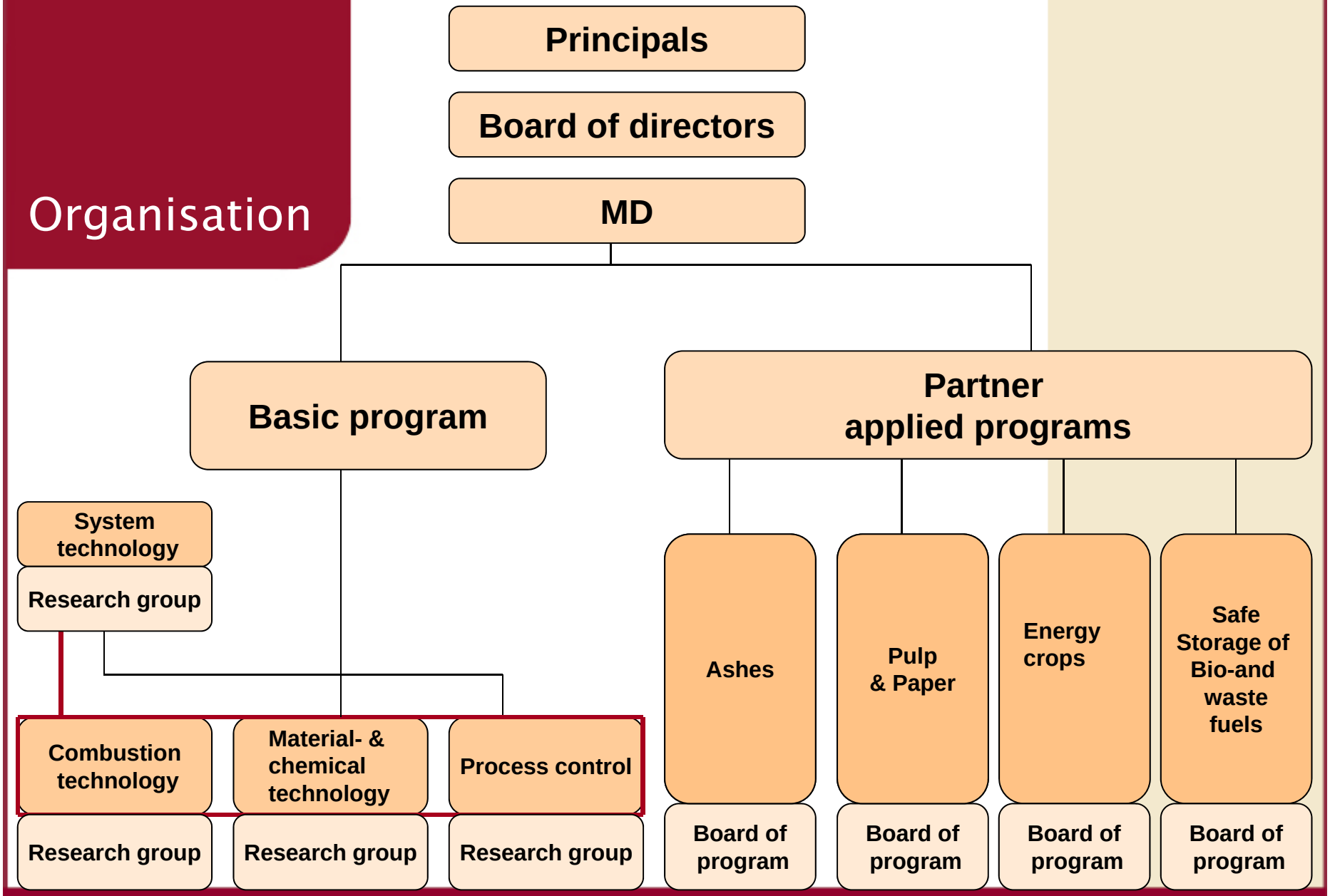
(Thermal Engineering Research Association)

- Founded 1968
- First research report published 1972
- 50 new reports published every year
- Today > 1100 reports filed
- Turnover approx 40MSEK (4 million €)

Many participants

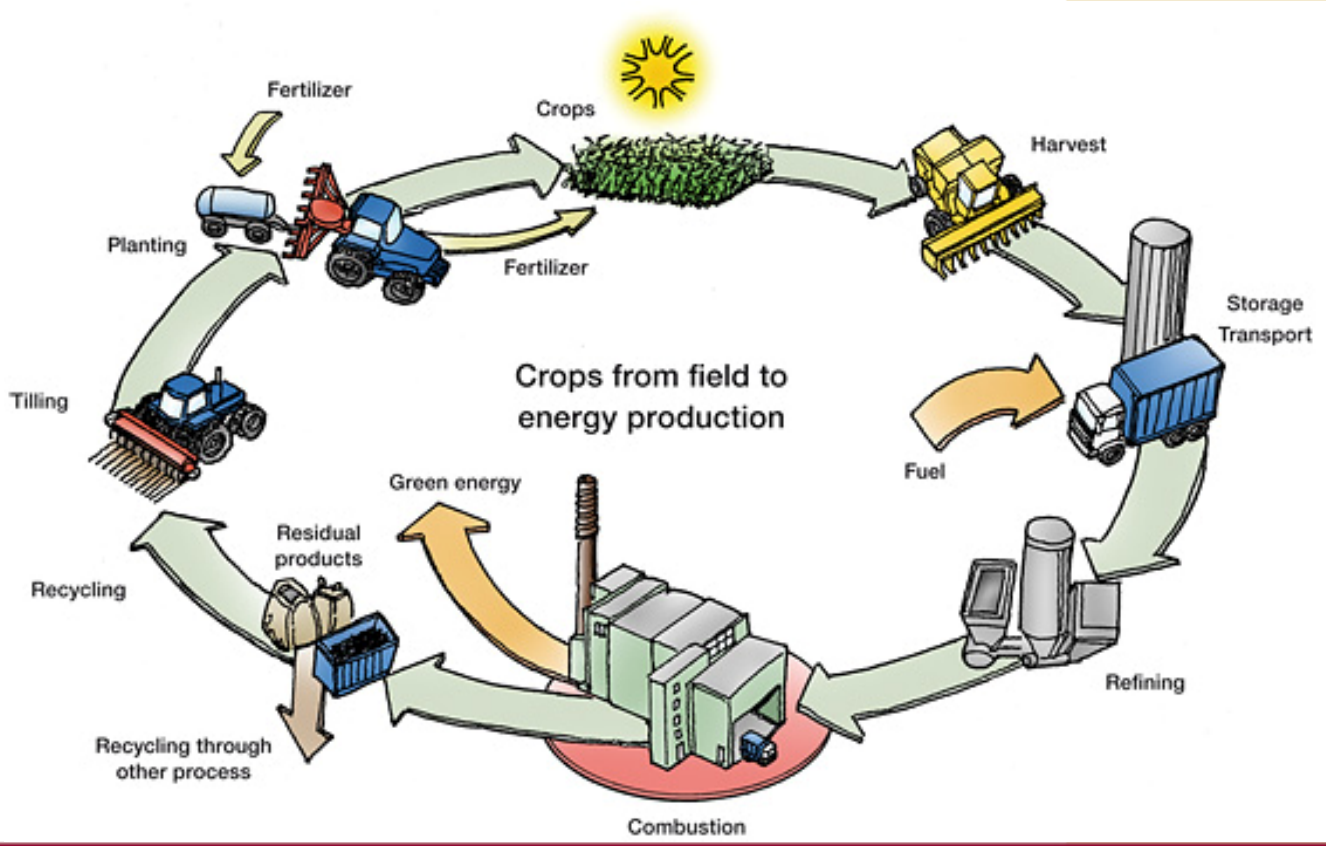
- Energy producers including district heating
- Manufacturing industry
- Pulp and Paper
- Energy and waste Associations
- Swedish Energy Agency

Organisation



PROGRAM

"Crops from field to energy "– willow, straw, cereals, RGC, hemp



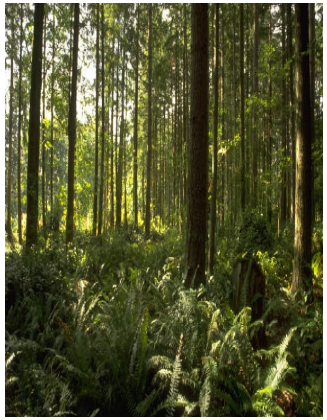
PROGRAM

Environmentally friendly use of non-coal ashes

Duration 2009 -2011
40 companies and authorities

Environment

Forestry



Geotechnics

Landfilling

Ash data base

www.varmeforsk.se/forskningsprogram/askprogrammet/allaska-sv

Method to introduce new fuels in power and heat production

- *Choice of fuel to suit the combustion technique*
- *Choice of fuel on the basis of fuel class*
- *Fuel mixtures*

FUELS

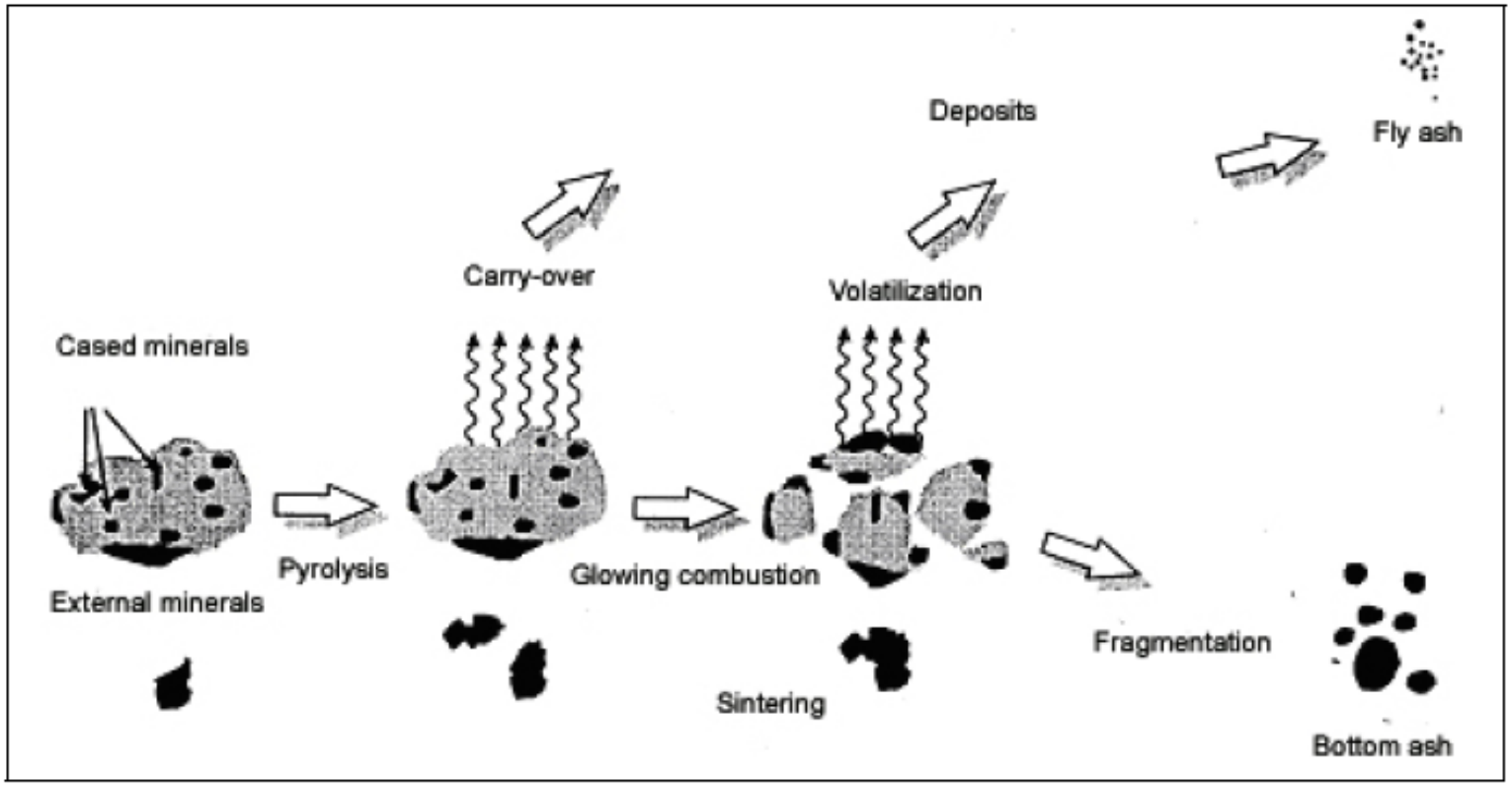
Woody biomass: ”clean”wood, recycled wood, forest residues, willow, bark, hardwood

Agriculture fuels: straw, RCG, grains, grain chuff hemp, cacao, olive residues, citrus pulp, shea nuts

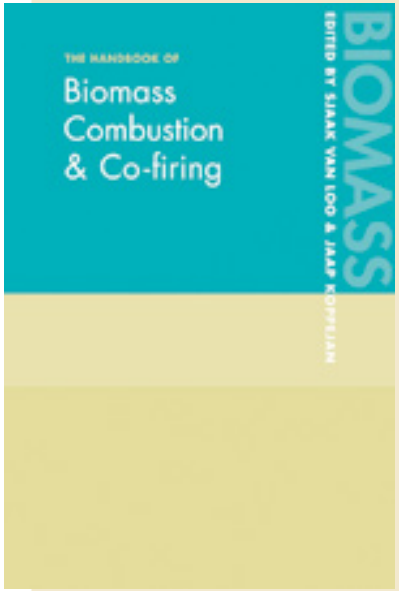
Waste fuels: sewage sludge, forest industry sludge, manure,rubber tyres, paper-wood-plastics, leather waste, cardboard reject

Other fuels: MBM (meat-and-bone meal), animal and vegetable fat (liquid), tall oil, peat

Background/Theory: combustion properties ash theory corrosion



Standards, Databases and Handbooks



Standards

ISO
CEN
ASTM
DIN
NEN
SIS

Databases

Phyllis
BIOBIB,
BIOBANK.
Biofuel
database,

Handbooks

IEA Handbook

IVLs
Miljöfaktabok
om bränslen
Pelletspärmen
Vedpärmen

CALCULATION ROUTINES

A. Conversion between ppm and mg/Nm3

1. Enter the gas contents in ppm or mg/Nm3.

Elementengelsk version\BILAGA A Final rev 0511094.xls	**Input**	**Calculated**
Unit	**ppm**	**mg/Nm³**
Nitrogen monoxide NO*	30	62
Nitrogen dioxide NO_2	10	21
Nitrogen oxides NOx (NO+ NO_2)*	40	82
Dikväveoxid N_2O	10	20
Ammonium NH_3	30	23
Methane CH_4	20	14
carbon monoxide CO	10	13
Carbon dioxide CO_2	10	20
Sulphur dioxide SO_2	20	57
Oxygen O_2	700	1000
Hydrogen chloride HCl	10	16
Hydrogen flouride HF	20	18
Water H_2O	300	241

NEWS

- NEW FUELS
- RISK ASSESMENT
- FUEL-RELATED PROBLEMS