Ministry of Fuel and Power

FUEL and the Future

VOLUME ONE



LONDON
ESTY'S STATIONERY OFFICE
Price 6s. Od. net

FUEL AND THE FUTURE

The Report of the Proceedings of the Conference is completed in the following volumes:

VOLUME II

Section D—High Temperature Processes.

Section E—The Carbonisation and Chemical Industries.

Section F-Special Industrial Sessions. Joint Session I-The Sizing and Grading of Coal.

PRICE 6s. By post 6s. 6d.

VOLUME III

Relevant parts of the Opening Session, followed by-

Section G-Modern Heating and the Architect.

Section H-TheHome and its Fuel Services.

Joint Session II—District Heating. Concluding with a summary of the closing session.

PRICE 3s. 6d. By post 3s. 10d.

OBTAINABLE FROM

H.M. STATIONERY OFFICE

AT THE ADDRESSES ON COVER PAGE 4

OR THROUGH ANY BOOKSELLER

MINISTRY OF FUEL AND POWER

FUEL and the Future

The Proceedings of a Conference held in London on October 8th, 9th and 10th, 1946, under the Auspices of the Fuel Efficiency Committee

VOLUME ONE

LONDON
HIS MAJESTY'S STATIONERY OFFICE
1948

CONTENTS

	Page
PREFACE	. vi
OPENING SESSION	
Dr. E. S. Grumell	. I
The Rt. Hon. Emanuel Shinwell, M.P.	. 2
Alderman C. W. Key, M.P.	. 7
'Sir Clive Baillieu	. 8
Lord Citrine	. 12
CLOSING SESSION	
The Rt. Hon. Emanuel Shinwell, M.P.	. 16
Dr. E. S. Grumell	. 17
The Rt. Hon. Sir Stafford Cripps, K.C., M.P	. 18
SECTION A—THE GENERATION OF STEAM	
SESSION I. THE AVAILABILITY OF WATER-TUBE BOILERS	
1. M. H. Adams: Remarks on boiler availability	. 26
2. W. G. Marskell: Investigations and recommendation	าร
regarding cleaning	33
3. Dr. H. E. Crossley: Research work at the Fu	
Research Station on boiler deposits	. 36
 Dr. G. Whittingham: Research work on deposits be British Coal Utilisation Research Association. 	•
5. R. Llewellyn Rees: Research work by the Boil	. 40
Availability Committee	· 45
6. J. Mayer: Boiler design	. 49
Discussion	• 53
SESSION II. DESIGN AND OPERATION OF SMALLER BOILERS	
1. Dr. E. G. Ritchie: Considerations affecting th	ıe
efficiency of the heating surface of shell boilers	• 54
2. A. S. Peacock: Water-tube boilers for industri	_
purposes in Great Britain	. 60
3. H. E. Pearsall: Mechanical stokers for shell boilers	
4. C. H. G. Hayward: The chain-grate stoker as applied to shell boilers	
5. E. L. Tinley: Underfeed stokers for firing steam	73
boilers	. 77
6. P. G. Ryder: The firing of shell boilers with pulverise	
fuel	. 90
7. P. A. Evans: The installation of steam boilers.	. 96
8. H. C. Oughton and R. W. Towers: Automatic contr	
of solid-fuel fired steam-raising plants	. 98
9. H. D. Watson: Industrial steam-raising plant.	. 104
D iscussion \cdot \cdot	. 116

SECTION A—THE GENERATION OF STEAM—continued	
SESSION IIIa. shunting locomotives	Page
1. R. E. Ketley: Trends in the development of design of	
the direct-fired steam locomotive	124
2. F. A. Harper: Notes on Diesel-electric shunting	
locomotives	127
3. John Alcock: Straight Diesel shunting locomotives.	131
4. C. D. Hanna: Fireless or steam-storage locomotives.	132
5. A. C. Thirtle: Experience in the operation of shunting	
locomotives	135
6. E. L. Diamond: Shunting locomotives for iron and	
steel works	137
7. J. Stafford: Shunting locomotives for colliery require-	
ments	141
8. G. J. Davis: Shunting locomotives on cement works.	142
Discussion	143
SESSION IIIb. THE TRAINING OF BOILERHOUSE AND FURNACE OPERATORS	
1. Dr. R. J. Sarjant: War-time training of personnel .	148
2. Dr. W. Abbott: Standard courses	149
3. E. W. Bussey: Education as viewed by the T.U.C	150
4. R. H. Brennan: Education as viewed by the	
employer	151
5. S. N. Duguid: Aids for training	152
6. T. M. Ashford: The practical aspect of classes for	
stokers	153
7. W. Bates: Standard methods of firing locomotives	153
8. W. Caudle: The Ministry Stoker-demonstrator's point	
of view	154
9. P. B. Silk: Duties of personnel	155
10. L. G. Northcroft: The status of the works engineer	155
Discussion	156
SUMMARY OF THE MAJOR CONCLUSIONS FROM SECTION A	
By Sir Johnstone Wright	158
SECTION B—STEAM UTILISATION	
SESSION I. WHERE EVERYTHING DEPENDS ON STEAM	
1. "Beer and Coal"—Bulletin for the brewing industry	161
Ralph Worssam: Introduction	162
Oliver Lyle: The utilisation of low-grade heat.	163
F. E. B. Moritz: Discussion	164
The Hon. John F. Gretton: Discussion	166
2. Fred Walker: Steam for the rubber industry.	167
3. R. Bunting: The efficient utilisation of steam in the	
chemical industry	170
4. L. G. Northcroft: Steam research and education.	172
Discussion	174
(79908)	A 2

SECTION B—STEAM UTILISATION—continued	
SESSION II. WHERE POWER AND STEAM NEEDS NEARLY BALANCE	Page
1. R. G. Sands: The paper and board makers' view of	I ago
fuel and the future	178
T. R. Young: Discussion	184
R. H. Brennan: Discussion	186
2. F. Courtney Harwood: Immediate and future aims	
of the laundry industry	187
3. W. O. Goldthorpe: "Laundering and coal"-	•
Bulletin for the laundry industry—introduction .	190
G. A. Crosland: Discussion	191
I. R. Brown: Discussion	192
4. J. J. Tomlinson: Steam and the hospital engineer.	192
R. G. Rogers: Discussion	193
J. C. Chynoweth: Discussion	195
5. D. L. Copp: The use of back-pressure steam.	195
Discussion	198
OFFICIAL TYP	
SESSION III. WHERE POWER OUTBALANCES PROCESS STEAM	
I. F. Buckingham: Where power outbalances process	
steam	207
2. E. E. Stimson and R. Bunting: Heat conservation in	
the dyeing and finishing trades	213
3. C. T. Wade: Steam utilisation in the dyeing and	
finishing trades	225
4. H. W. Perkins: Heat and power in the hosiery	
industry	230
5. R. H. Harral: Power for cotton mills	231
6. T. H. Carr: Public electricity supply in the woollen	
industry and ancillary trades	234
7. T. W. Evans: Power saving in textile mills	238
8. H. R. Lupton: Power for pumping	241
g. W. R. M. Belcher: Mechanical power transmission in	
engineering works	241
Discussion	243
SUMMARY OF THE MAJOR CONCLUSIONS FROM SECTION B	
By J. G. Bennett	244
SECTION C—HEAT FOR DRYING	
SESSION I. DRYING, CONDITIONING AND STORING	
I. J. C. Lowson: The electric infra-red process	246
2. R. F. Hayman: Town gas for drying by radiant heat	
3. A. M. Lehmann: Efficiency of conveyor drying and	
enamelling plants	263
4. Dr. A. W. Scott: The drying of foodstuffs and waste	_
products	267

V	
SECTION C-HEAT FOR DRYING-continued	Page
SESSION I. DRYING, CONDITIONING AND STORING—continued	
5. E. H. Farmer and C. G. Six: Spray and roller drying	277
6. A. S. White: The drying of chemical products by the atmospheric tray dryer	288
7. C. R. Love: The drying of china clay	290
8. Charles Stevens: Leather drying	292
9. A. C. Hutt: Drying, conditioning and storing .	294
10. K. H. Sambrook: Use of oil fuel for drying	295
Discussion	296
SESSION II. FACTORY HEATING AND AIR CONDITIONING	
1. Dr. Oscar Faber: Factory heating and fuel savings.	301
2. J. W. Cooling: Air conditioning	310
3. H. H. Bruce: Temperature gradients	312
4. J. L. Musgrave: Radiant heating	315
5. L. Copeland Watts: Insulation and heat loss (air and	
structure losses)	317
6. F. R. L. White: Application of instruments to boiler plant	010
7. J. R. Kell: Thermostatic control	319
8. G. P. Barnett: Fuel economy in its relation to atmos-	320
pheric conditions in factories	322
Discussion	325
SESSION III. HEAT FOR AGRICULTURE AND HORTICULTURE	
1. F. E. Bulletin No. 46, introduced by W. H.	
Gamble: "How glasshouse growers can save fuel"	330
2. C. B. Chartres: Grain drying and the combine	
harvester	332
3. David Fairclough: Grass and herb drying	337
4. Dr. A. W. Scott: Engineering aspects of grass drying	340
5. Dr. A. H. Burgess: Hop drying	345
6. H. J. Hamblin: Power saving with special reference	~
to tractors	347
8. C. A. Cameron-Brown: Electric heat for agriculture	350
and horticulture.	353
9. D. Stewart: Glasshouse heating, with special reference	333
to tomato growing	358
10. L. Kinnell: Artificial rain	360
Discussion	363
SUMMARY OF THE MAJOR CONCLUSIONS FROM SECTION C	
By W. L. Boon	368 .

PREFACE

The general need for efficiency in British industry has never been greater than it is today. Fuel efficiency is an integral part of production efficiency, and correct fuel utilisation is now, and will be in the future, essential in every factory, establishment and home. For this reason, the Fuel Efficiency Committee of the Ministry decided in March, 1946, to convene a conference at which both the present state of development of fuel utilisation and its future trends could be freely discussed by experts in each individual field in an informative manner for the general guidance of all fuel users, industrial and domestic.

Nearly five thousand industrialists and members of domestic organisations interested in fuel usage attended the conference on 8th, 9th and 10th October, 1946.

After a joint opening session at which those assembled were addressed by prominent members of the Government, Industry and Trade Unions, the conference divided into eight sections meeting simultaneously in different places, each section holding three sessions consecutively. The sections dealt with the following subjects:—

Section "A"—The Generation of Steam.

Section "B"—Steam Utilisation.

Section "C"—Heat for Drying.

Section "D"—High Temperature Processes.

Section "E"—The Carbonisation and Chemical Industries.

Section "F"—Special Industrial Sessions.

Section "G"-Modern Heating and the Architect.

Section "H"—The Home and its Fuel Services.

Two joint sessions were then held simultaneously, one dealing with the Sizing and Grading of Coal, and the other with District Heating, after which there was a closing session presided over by the Rt. Hon. Emanuel Shinwell, M.P., Minister of Fuel and Power, and addressed by the Rt. Hon. Sir Stafford Cripps, K.C., M.P., President of the Board of Trade, at which also the sectional chairmen summarised the conclusions of their meetings.

The proceedings of the conference have been printed in three volumes, of which this book comprises the first. It is devoted to the opening and closing sessions together with the first three technical sections dealing with the generation of steam, steam utilisation, and heat for drying.

Considerations of space have made it necessary to curtail most of the communications to a greater or lesser extent by abridgement, summarisation or condensation as best fitted the subject. Every care has been taken to avoid the omission or distortion of any essential matter, and the authors are thanked for submitting to this unfortunately necessary operation.

Where requested, acknowledgments have been formally made in the text of this publication. In addition, the Ministry wish to express their thanks to all those who have contributed to the success of this conference and without whose aid it could not have been held.

Finally, it should be pointed out that the fact of publication of these proceedings must not be held to imply that all the views expressed therein are necessarily in every respect those of the Ministry of Fuel and Power.