INTERECOTECH

Leading

Clean Coal Technology
INTERRECOTECH introduces
Cutting-edge Coal Gasification and High Efficiency Power Generation Technology
Integrated Coal Slurry Gasification Combined Cycle (ICSGCC)

METHOD FOR PSEUDO-DETONATED GASIFICATION OF COAL SLURRY IN A COMBINED CYCLE

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(54) Title (EN): METHOD FOR THE PSEUDO-DETONATED GASIFICATION OF COAL SLURRY IN A COMBINED CYCLE

(57) Abstract:
(EN): The invention relates to the field of power engineering and, more specifically, to systems for generating electricity based on the use of solid fuel, primarily brown and black coal. In the coal gasification method, a gasifier is fed with a uniform activated coal water fuel, the droplets of which are of equal size and the coal particles in said droplets having a similar granulometric composition. The fuel droplets are introduced intermittently in separate doses of fuel with a certain amount of motion being imparted thereto. The milling of the coal for the activated coal water fuel preparation method is adjusted adaptively according to the criterion of the actual amount of volatile substances given off by the coal, and the coal is thoroughly classified according to its granulometric composition. The invention provides for more extensive recovery of thermal energy from coal and more efficient electricity generation.

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The invention relates to the field of power engineering and, more specifically, to systems for generating electricity based on the use of solid fuel, primarily brown and black coal.

In this coal gasification method, a gasifier is fed with a uniform activated coal water fuel, the droplets of which are of equal size and the coal particles in these droplets have a similar granulometric composition.

The fuel droplets are introduced intermittently in separate doses of fuel with a certain amount of motion being imparted thereto.

The milling of the coal for the activated coal water fuel preparation method is adjusted adaptively according to the criterion of the actual amount of volatile substances given off by the coal, and the coal is thoroughly classified according to its granulometric composition.

The invention provides for more extensive recovery of thermal energy from coal and more efficient electricity generation.
Project history

Since the end of 1950s Soviet Union started developing new ways for utilising coal slurries and using them for power generation. Because of economical changes in Soviet Union and very low oil and gas prices which made the usage of alternative ways of coal combustion are absolutely useless.

Recently Russian Federation renewed development and implementation of CWS technology for district heating and power plants. Despite all the research undertaken by Russian and Western companies, a better solution remained to be found. INTERECOTECH has heavily invested in research within these fields.

A group of Russian scientists and power engineers, led by Vladimir P. Sevastyanov (Director of Scientific R&D and substantial shareholder in Interecotech Pty Limited), developed and patented new environmentally friendly and cost effective technologies and equipment using low rank coals for production of Activated Coal Water Fuel (ACWF™) utilising the latest engineering solutions

ACWF™ can replace Mazut (low grade oil) and can be used as a feedstock for production of high quality, low cost, hydrogen-enriched Syngas.

INTERECOTECH further developed, patented in Russia (RU2433282) and lodged PCT Application with WIPO (Publication number WO2011/139181) the technology known as Integrated Coal Slurry Gasification Combined Cycle (ICSGCC)
ICSGCC – 3 Integrated Processes

INTERECOTECH (IET) is cutting-edge coal gasification and high efficiency power generation technology.

To distinguish the IET technology from conventional ‘Integrated Gasification Combined Cycle’ (IGCC) processes, the new combined cycle process has been called ‘INTEGRATED COAL SLURRY GASIFICATION COMBINED CYCLE’ - ICSGCC

ICSGCC high efficiency technology for the conversion of coal to electricity consists of 3 deeply integrated processes:

1. Preparation of the Uniform Activated Coal Water Fuel (UACWF);
2. Gasification of the UACWF
3. Combined Cycle (gas, steam and organic turbines) to generate electricity.
Part 1

Uniform Activated Coal Water Fuel (UACWF)
Development of Activated Coal Water Fuel (ACWF™)

Coal–water slurry (CWS) holds promise to offer a long-term alternative to fuel oil, and is also being conceived as an attractive fuel for the power generation industry.

New methods of CWS production, developed and patented by IET (Russia) staff deliver a completely new kind of super-charged feedstock for gasifiers and combustion reactors named **ACTIVATED COAL WATER FUEL (ACWF)**.

Coal of any type can be used as a raw input material for ACWF™ - lignite and brown coals are best suited.

Using patented milling and homogenization technologies, the ACWF™ is produced by causing high energy and high pressure cavitation in the coal-water mixture.

The thermal and chemical properties of the ACWF™ produced mean higher rates of reactivity when fed into gasification or combustion reactors – with spectacular results in gas composition and heat produced.

The input energy required to produce ACWF™ as a feedstock to other processes is much lower than for conventional feedstock, thereby reducing CO₂ emissions over process life-cycle.
Demonstration plant for preparation and combustion of ACWF

(Novosibirsk, Russia 2000)

ACWF manufacturing plant (6t/hr)

Preliminary coal milling 3.5 t/hr

Activator 6 t/hr of ACWF

ACWF combustion chamber
ACWF/MCF Production Technology
ACWF™ – Uses and Applications

ACWF can be used in place of oil in small, medium and large heating and power generation plants.

ACWF is suitable for existing oil and coal boilers.

In the future IET intends to research and develop the concept of a modified diesel engines that burn ACWF in a way that is economically competitive with diesel fuel.

ACWF™ – Benefits

The presence of water in ACWF reduces harmful emissions into the atmosphere and makes the coal explosion-proof.

By converting the coal into a liquid form, delivery and dispensing of the fuel can be simplified.

Because of the relatively low cost of coal when compared to other energy sources, ACWF is a very competitive alternative to heating oil and gas.

Depending on geographical area the price per unit energy of ACWF™ will be a minimum of 30% to 70% lower than the equivalent oil or gas.

Low emissions make ACWF as very cost effective and environmental friendly fuel for heat and power generation.
Combustion of ACWF™

Combustion of ACWF delivers:

- More effective burning of volatiles. Combustion of additional H₂ and CH₄ adds significantly to heat produced;
- More effective burning of fixed carbon. Reduces to nearly zero the proportion of unburned fixed carbon;
- Significant SOₓ and NOₓ reductions;
- Increase of thermal efficiency of up to 5-15% (using Vic Brown Coal) results in 4-8% reductions in CO₂ outputs.

Estimated ACWF properties (Latrobe Valley brown coal)

<table>
<thead>
<tr>
<th>Victorian Latrobe Valley Brown coal</th>
<th>Activated Coal Water Fuel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proximate Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>Total moisture (%, ar)</td>
<td>61.5</td>
</tr>
<tr>
<td>Ash (%, ar)</td>
<td>9.8</td>
</tr>
<tr>
<td>Volatile matter (%, ar)</td>
<td>19.5</td>
</tr>
<tr>
<td>Fixed carbon (%, ar)</td>
<td>18.2</td>
</tr>
<tr>
<td>Gross calorific value (MJ/kg, ar HHV)</td>
<td>10.2</td>
</tr>
<tr>
<td><strong>Ultimate analysis</strong></td>
<td></td>
</tr>
<tr>
<td>Unburnt carbon in furnace ash (%)</td>
<td>18.0</td>
</tr>
<tr>
<td>Unburnt carbon in fly ash (%)</td>
<td>18.0</td>
</tr>
<tr>
<td>Proportion of ash emitted as fly ash (%)</td>
<td>90</td>
</tr>
</tbody>
</table>
IET has developed a new type of the feed stock for the production of hydrogen enriched syngas: **Uniform Activated Coal Water Fuel (UACWF)** prepared by special milling and hydro-shock disintegration methods and equipment.

IET technology for the preparation of **UACWF** focuses on the use of coals of any type and grade, including low-grade coal, coal processing plant wastes, slag containing unburned carbon and coal fines.

Detailed descriptions, drawings and adaptive control algorithms for the fully automated UACWF preparation technology are patented by IET.
Part 2

ICSGCC
Gasification Technology
Development of ACWF Gasification Technology

‘METHOD AND APPARATUS TO PRODUCE SYNGAS’

Inventors:
Baev V.S. (RU);
Sevastyanov V. P. (RU)

Assignee:
Baev V.S. (RU);
Sevastyanov V. P. (RU)

Date of Patent:
20 December 2004

<table>
<thead>
<tr>
<th>IET Gas Composition, %</th>
<th>CO₂</th>
<th>C₃H₈</th>
<th>CO</th>
<th>H₂</th>
<th>CH₄</th>
<th>N₂</th>
<th>Calorific value MJ/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>IET G - Gas A</td>
<td>9.73</td>
<td>0.54</td>
<td>38.1</td>
<td>45</td>
<td>4.34</td>
<td>1.1</td>
<td>14.42</td>
</tr>
<tr>
<td>IET G - Gas B</td>
<td>47.6</td>
<td>2.0</td>
<td>28.4</td>
<td>9.8</td>
<td>1.1</td>
<td></td>
<td>7.22</td>
</tr>
</tbody>
</table>
ICSGCC Gasification Technology

ICSGCC – The Process

- Prepared UACWF is pumped under pressure into the gasifier.
- Final activation of the fuel is carried out directly in the gasifier, under high pressure, thus providing a high degree of activation of fuel for its conversion.
- The ICSGCC gasifier performs a controlled explosive combustion conversion of UACWF with specified frequency pulsation.
- At the peak of the pulsation in a spatially localized zone - short pulses of high pressure are created, so we are building on technology of pulsating gasification flow.
- This is analogous with resonators of pulsing rocket engines, which ensures high mass transfer and heat exchange of the reaction components; efficient utilisation of the gasifier volume; and production of high quality SYNGAS

ICSGCC – Benefits

- Hydrogen-rich syngas is achieved through the properties of UACWF. The activated water components of UACWF decompose into hydrogen and oxygen gas, due to the intensity of the radiant energy in the reaction chamber of the gasifier.
- By-products of gasification and gas-treatment systems such as slag, fly ash, resin, gasoline and sulfur are valuable commercial products.
- The ejector type flow reactor of the gasifier ensures the continuity of the process.
- The reactor-ejector is relatively easy to run.
- The design of the reactor ensures reliability and safety of all systems.
<table>
<thead>
<tr>
<th>Ph.</th>
<th>Description of the phases of UACWF conversion</th>
<th>Gasifier’ technological zoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fully-discrete dosing of fuel with a deterministic amount of motion of each drop of fuel.</td>
<td>Zone FP, Fuel pylon</td>
</tr>
<tr>
<td>2</td>
<td>Motion control of two-phase fuel composition with the formation of this movement into deterministic spiral-vortex aerodynamic structure and construction of the drop -gas dose into synchronized vortex of fuel – oxidizer surface layer. For ACWF prepared from the coking coals, surface of the fuel droplets sprayed with the dropout fine fractions of the coal dust.</td>
<td>Zone FPF, Final fuel preparation</td>
</tr>
<tr>
<td>3</td>
<td>Predominantly radiation heat supply and evaporation of the moisture from the surface of the droplets. Migration of solid particles to the surfaces of droplets. For ACWF prepared from the coking coals, the beginning of sintering of coal particles on the surface of droplets into agglomerate.</td>
<td>Zone RTA, radiation-thermal activation of the fuel droplets and their technological metamorphism accompanied by conversion of the carbon</td>
</tr>
<tr>
<td>4</td>
<td>Predominantly radiation heat supply, the evaporation of moisture from the interior of the droplet with the overheating of its vapors. For UACWF prepared from the coking coals, completion of the formation of porous sinter shells drops. Increasing the temperature dried droplets.</td>
<td>Zone PDC, the main pseudo-detonation conversion</td>
</tr>
<tr>
<td>5</td>
<td>Predominantly radiation heat supply and further evaporation of moisture from the interior of the droplets, including ACWF prepared from the coking coals, through the pores sinter membranes, increasing the internal pressure in the drops with stretching sintering shells and growth of droplets. Activation of the surfaces of coal particles in the pores of the sinter is accompanied by conversion of carbon on these surfaces. The completion of evaporation of the free moisture from the droplets and temperature pressure jump on the residues of the fuel droplets.</td>
<td>Zone PDC, the main pseudo-detonation conversion</td>
</tr>
<tr>
<td>6</td>
<td>Predominantly radiation heat supply. The rapid attainment of droplet residues maximum temperature with the release of the volatile matter and fluidization of the internal moisture of floccules and micro-pores of the coal particles which accompanied by quasi-synchronized micro-explosions of all droplets residues, with a maximum dynamics conversion of the carbon due to the explosive micro-disintegration of coal particles, including explosion of sintering shells of UACWF prepared from the coking coals.</td>
<td>Zone PDC, the main pseudo-detonation conversion</td>
</tr>
<tr>
<td>7</td>
<td>A further supply of heat and conversion afterburning of the fuel components to meet requirements of the technological stoichiometric regulations</td>
<td>Zone CAB, afterburn</td>
</tr>
<tr>
<td>8</td>
<td>Supply of cooling gas agent and lowering the temperature of intermediate conversion to a temperature of hardening of fuel dose slag residues</td>
<td>Zone C, cooling</td>
</tr>
<tr>
<td>9</td>
<td>Supply of cooling gas agent, further lowering the temperature of intermediate conversion and hardening of all fuel dose slag residues</td>
<td>Zone SH, hardening of slag</td>
</tr>
<tr>
<td>10</td>
<td>Braking the flow of intermediate conversion of the tangential component of their movement, the withdrawal of the intermediate gas phase precursors of the gasifier and the dumping of solid slag into slag receiver</td>
<td>Zone GC, gas output</td>
</tr>
<tr>
<td>11</td>
<td>Closing upper and open lower hermetic gate with the withdrawal of the solid slag from the gasifier. Closing bottom and open top hermetic gate to receive the next volume of the slag.</td>
<td>Zone SP, slag port</td>
</tr>
</tbody>
</table>
Diagram: Micro-cycles for gasification of UACWF utilising Controlled Pseudo–Detonation Conversion Technology

Chart 1 (Reading charts from the bottom of the page up) Time interval $t_4 \div t_9$ shows the change in angular velocity of the rotor of the fuel-calibrating dispenser through which the fuel pylon in the given time forms the size of the fuel droplets, their quantity and a certain amount of the vector movement.

Charts 2 & 3 shows the change in the distance by the angle of the fuel-calibrating dispenser formatting weight of the fuel dose.

Charts 4 & 5 show the speed advancement of the fuel-conversion composition linear-vertical velocity component through the gasifier’ zones, FPF, RTA, PDC, CAB, C, SH, GC, and the tangential component of velocity in the zones of the gasifier FPF, RTA, PDC, CAB, C, SH, respectively.

Chart 6 shows the deposition of solid fuel particles in Class 0 ... 30 on the surface of the fuel droplets from the time $t_1$ to time $t_9$. This process is used only in cases of caking coals.

Chart 7 shows the total absorption of heat by the drops of the UACWF, radiant heat emitted by the walls of the gasifier, the intensity of which is due to the fact that their outer surfaces are also the walls of the combustion chamber of a gas turbine. Also shows process of fluidising of the water (contained in the drops of the fuel) and fluidising of water contained in micropores and flocculis of the solid fuels. For example, for a droplet diameter of 1.0 mm time $t_4 \div t_7$ required for activation is about 2.5 seconds.

Chart 8 The time interval $t_7 \div t_9$ (zone PDC) shows thermo-destructive, explosive fluidization of the residual water in the dried fuel drops and flocculis and micropores of the solid fuels, also intense combustion of volatiles and pressure jump in the PDC zone.

Chart 9 shows completion of the conversion process carried out in of CAB zone of the gasifier in the time interval $t_9 \div t_{11}$ (convensional afterburning of UACWF droplets residues reactive components).

Chart 10 shows the variable component of the temperature in zones C and SH. Temperature-time point «A», at time $t_{12}$, when the temperature in the centre of the zone C of the gasifier is reduced to the point $T_{15}$ hardening of the ash (slag). At the point «A» begins the process of further cooling of the soft particles of ash (slag) throughout their volume, continuing up to the time $t_{13}$, when the temperature of solidification of ash (slag) is reached in the entire volume of each particle ash (slag) of the fuel dose.

Chart 11 illustrates the transition of ash (slag) from the soft state to the solid state, in the time interval $t_{13} \div t_{15}$. From the point in time $t_{13}$, the growing "negative" temperature difference in the zone of the gasifier SH supports the curing process of ash (slag), which ends at time $t_{15}$.
ICSGCC - Energy Balance

Black Coals

Brown Coals
Properties of IET Syngas

<table>
<thead>
<tr>
<th>Composition, %</th>
<th>CO₂</th>
<th>CO</th>
<th>H₂</th>
<th>CH₄</th>
<th>N₂</th>
<th>H₂O</th>
<th>Calorific value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRL IDGCC Syngas Latrobe Valley Brown coal</td>
<td>2.4</td>
<td>19.8</td>
<td>10</td>
<td>1</td>
<td>30.2</td>
<td>36.5</td>
<td>4 MJ/kg</td>
</tr>
<tr>
<td>Nakoso 250MW Air-blown IGCC Demonstration Plant Australian Black Coal</td>
<td>2.7</td>
<td>31.9</td>
<td>10</td>
<td>1.4</td>
<td>54</td>
<td>—</td>
<td>5.6 MJ/m³</td>
</tr>
<tr>
<td>IET Syngas # 1 Russian Brown coal type БР2</td>
<td>4</td>
<td>41.6</td>
<td>50</td>
<td>3.3</td>
<td>1.1</td>
<td>—</td>
<td>11.4 MJ/m³ 16.6 MJ/kg</td>
</tr>
<tr>
<td>IET Syngas # 2 Russian Black coal type AC</td>
<td>4.4</td>
<td>36.8</td>
<td>54</td>
<td>3.2</td>
<td>1.6</td>
<td>—</td>
<td>11.1 MJ/m³ 17.3 MJ/kg</td>
</tr>
</tbody>
</table>

“Patented by IET, the UACWF Gasification process produces hydrogen enriched Syngas of higher quality and at much lower cost than any other IGCC technology currently employed”
ICSGCC Gasification of UACWF – Benefits

The tests result of Russian laboratory gasification of UACWF are included in the patent, proving much greater efficiencies compared to other technologies.

IET technology for efficient coal gasification has the following advantages over conventional technologies:

- Higher content of hydrogen in the intermediate gas;
- Higher calorific value;
- No injection of steam and oxygen required for the process;
- Significant reduction of the gasification plant

ICSGCC Gasification of UACWF – Uses

- Direct combustion in converted coal or oil fired boilers;
- Replace Natural Gas to produce heat;
- Coal-to-Liquid (CTL) fuel production;
- Electricity generation

IET Syngas – Production Costs

The high market price of natural gas has increased the cost of electricity produced by natural gas fired power plants.

Utilising Latrobe Valley brown coal and IET gasification technology, estimated syngas production costs $1 - $2/GJ, depending on the size of the gasification plant and price of coal.
Part 3

ICSGCC and Power Generation Technology
ICSGCC and Power Generation Technology

The exhaustion of the major fossil energy sources on earth in near future and the serious environmental pollution from the fuel combustion processes in the presently applied technologies are among the most important and challenging of problems in modern society.

The sustainable development of mankind requires the development of “green” power devices characterised by high fuel energy conversion efficiency, less pollution to the environment and convenience of use.

Integrated Gasification Combined Cycle (IGCC) technologies have been commonly accepted to be a kind of clean, safe and convenient power source with high energy efficiency and are on the verge of revolutionising the electric power industry by offering better ways to produce electricity and to deliver it to the consumers.

Among all the advanced IGCC competitor technologies being developed, which one is the best choice for ideal green power generators in the 21st century?

IET’s ICGSGCC technology is more efficient, and more environmentally friendly than any other IGCC technologies currently employed or under development in the power generation industry
To maximise coal thermal energy and to increase the efficiency of coal fired power generating plants, IET integrated Syngas production processes with Combined Cycle Electricity Generation.

The efficiency of the ICSGCC (2 Cycles) technology, utilising brown and/or black coals is estimated to be in the range of 64-70%, CO$_2$ emissions 0.48-0.44t/ MWh.

The efficiency of the ICSGCC (3 Cycles) technology, utilising brown and/or black coals is estimated to be in the range of 80-85%, CO$_2$ emissions 0.40-0.38t/ MWh.
The high-quality Syngas and new engineering solutions for power generation lifecycle maximises use of coal thermal energy and improves economic and environmental indicators.

**High thermal efficiency and low CO₂ emissions are realised through:**

- Sequential use of three turbines - gas, steam and organic, with supercritical parameters of the various working fluids;
- Application of the Vortex Mass-Temperature Stratification Method to increase the temperatures of the fluids used in turbines, creating positive recuperative power inter-cycle links;
- Effective use of the coldest parts of the stratified working fluids as a cooling agent for the condensers of the previous cycle;
- Minimisation of the traditional thermal losses to the environment.

Detailed description, drawings and adaptive control algorithm for the fully automated Combined Cycle Power Generation Process Patented by IET.
IET Contribution for Global Energy and Environment Solutions

The reduction of CO₂ emissions is one of today’s most important global issues. Attention is focused on the major sources of carbon dioxide and other greenhouse gas emissions. Coal energy sourced for electricity generation is a significant component of human-generated CO₂ emissions.

Because the world’s population is growing, and because the world’s developing countries have the right to a higher standard of living, the demand for energy will increase substantially. Hence the use of coal will continue to increase globally.

To reduce the volume of emissions, IET is committed to meeting the environmental responsibilities that come with a development of a new technology.

**High standards of environmental performance are achieved through:**

- Maximising energy efficiency thus minimising emissions;
- Minimising process energy consumption thus increasing net energy output;
- Maximising energy and process water recovery
IET Technology Efficiency Impact on CO₂ Emissions

- Brown coal pulverised fuel
- Black coal pulverised fuel
- Super/ultra critical pulverised fuel
  - HRL 10MW Air-blown
  - IDGCC Demonstration Plant Latrobe Valley Brown coal
  - Nakoso 250MW Air-blown
  - IGCC Demonstration Plant Australian Black Coal
  - Integrated Gasification Fuel Cell

- In use
- Under development
- Future development

Tonnes CO₂ per MWh (Electrical)

Thermal efficiency %
IET Technology Impact on Power Generation Cost

Estimated Latrobe Valley CO₂ emissions & production costs

<table>
<thead>
<tr>
<th>Technology</th>
<th>CO₂ emissions Mt/a</th>
<th>Average CO₂ emissions kg/MWh</th>
<th>Reduction of CO₂ emissions Mt/a</th>
<th>Cost $AUD per MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Latrobe Valley</td>
<td>57</td>
<td>1200</td>
<td>-</td>
<td>40</td>
</tr>
<tr>
<td>HRL IDGCC</td>
<td>35</td>
<td>750</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td>IET ICSGCC (2 Cycles)</td>
<td>23</td>
<td>470</td>
<td>34</td>
<td>max 20</td>
</tr>
<tr>
<td>IET ICSGCC (3 Cycles)</td>
<td>19</td>
<td>400</td>
<td>38</td>
<td>max 15</td>
</tr>
</tbody>
</table>

Cost of Electricity
In addition to the environmental benefits of ICSGCC, the estimated production cost, utilising Latrobe Valley brown coal, in the range of $15-$20/MWh (net), depending on the size of the power plant and price of coal.

Cost of Syngas
Current Natural Gas high price increased the cost of electricity produced by NG powered energy plants. Utilising Latrobe Valley brown coal and IET gasification technology, estimated syngas production cost will cost $1-$2/GJ, depending on the size of the gasification plant.

Capital Costs
At a nominal IGCC plant size of 250 MWe the price typically falls within 1,700 to 2,200 $/kW range. With the degree of reuse of existing site infrastructure Interecotech ICSGCC plants are targeted to enter the marketplace with a price that will reduce that capital cost to the range of 20 to 30 percent.

Development Costs
With sufficient funding, and government support and with a degree of reuse of existing site infrastructure Interecotech is willing and able to design and build the first ICSGCC (2 Cycles) pilot plant within first 3 years of operation and upgrade to 3 Combined Cycles in the following 2 years.

Worldwide deployment of ICSGCC
The total worldwide investment required to deploy ICSGCC in full would be about business-as-usual investments, between now and 2030. This is a substantially lower bill compared to the much higher financial and humanitarian consequences of higher global warming.
Summary - IET ICSGCC Technology Impact on Power Generation

ICSGCC technology offers:

- A new world benchmark in power generation utilising vast low-grade coal and coal-waste resources
- 50% increase in energy output per tonne of coal
- 30 -70% reduction of overall cost of production per MWh
- Significant reduction in capital outlay due to reduction in plant size
- The ability to utilize brown coal, black coal, and even coal tailings/fines
- The latest information technology to simplify plant operations and maintenance
- ACWF™ and Syngas can be produced and used as stand-alone products without progressing to power production
- Electricity produced is re-used to make the process self-sufficient, with excess electricity sold to the grid
- IET engineers have forecast the potential for ICSGCC technology to supersede pulverized coal and IGCC power generation technology, and become the new global benchmark for coal powered generation of electricity and heat.