

## Way Forward - Discussions

- Are there any other technologies that need to be developed in parallel with the various fuels on offer?
- What type of companies would make ideal collaborative partners?
- With all of the 'novel fuels' currently being developed, which ones have the most potential for industrial gas turbines?

- What is required to be done ?
- Identify areas of collaboration.
- Identify funding resources.
- Identify enabling technologies.
- Set-up investment guidelines.
- Make-to-Fit vs. Fit-to-Make ?

- Does the generation of syngas through gasification or pyrolysis is sufficiently mature and free of operational problems?
- Should such projects as “fast pyrolysis” be aimed at the gas turbine market, or should they provide liquid fuels suitable for transportation use?
- Should the landfill gases be classed as renewable fuels, or should more effort be made in re-cycling thus minimising the amount of rubbish sent to landfill?

- Path forward for obtaining fundamental fuel's properties at conditions of interest.
- Prioritization of fundamental properties (flammability, autoignition, instabilities)

# Summary – Session 1

- Wobbe Index an insufficient measure to compare fuels of very different compositions from operability from of view
- Data on turbulent flame speed of syngas type fuels is required at realistic gas turbine operating condition
- Utilization of solid municipal waste to produce power, which more and more local governments are presently considering, offers a potential market for small and medium sized gas turbines.
- Although passive techniques will still dominate the gas turbine combustion control, however, simpler active methods may still have useful applications.
- Need for Computational Fluid Dynamics, in addition to test and experimental facilities, in the research and development of advanced gas turbine
- Utilization of synergies between aerospace and industrial gas turbines
- Urgent need to allocate funding for the research and development of advanced gas turbines

# NRC-IAR-GTL Commitment

- Support Gas Turbine research and technology development
- Major initiatives
  - AFFORD
  - CAETRM
- Facilities investment
  - AFFORD (Syngas and test cells)
  - Air moving and treatment
  - Altitude chamber
  - Icing certification
  - Optically accessible hi-pressure combustions rig
  - Internal turbomachinery wind tunnels
  - Gear-box test rig
- Bring together and educate gas turbine community on future needs and technologies

