



**MIDWEST  
CHP  
APPLICATION  
CENTER**

**COOLING, HEATING, AND POWER**

**REGIONAL APPLICATION CENTER**

**TECHNICAL ASSISTANCE PROGRAM**

March 2002

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*The information provided herein is general guidance. Each installation should be assessed on a case-by-case basis, since special situations merit special considerations.*

## 1. PURPOSE

The purpose of the Technical Assistance Program (TAP) is to describe the process for the Regional Assessment Center (RAC) to provide assistance to interested parties to help them overcome perceived barriers and to provide technical solutions to foster the installation of Cooling, Heating, and Power (CHP) systems into the target market of commercial, institutional, multi-unit residential and light industrial applications. Support may be in the form of technical information, education, or assistance.

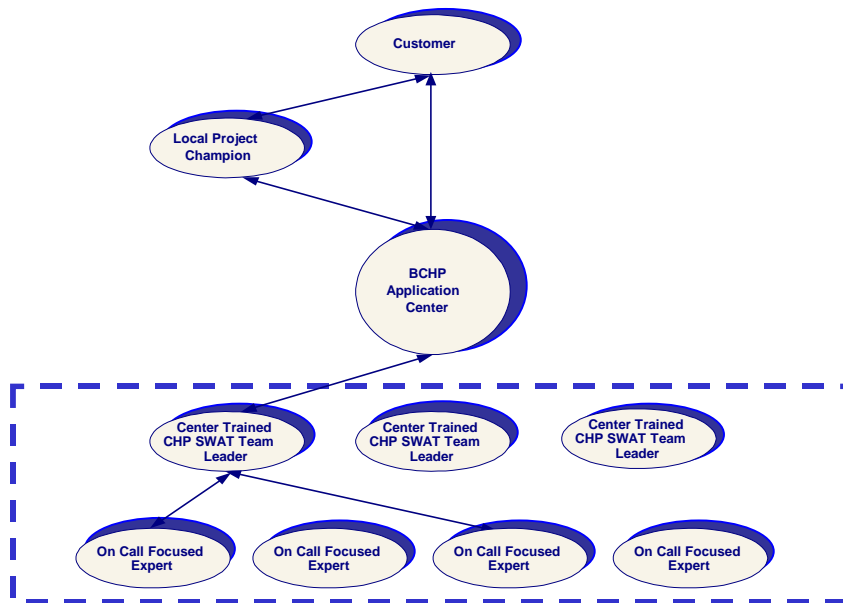
## 2. SWAT TEAM

### 2.1 Concept Overview

Key to the TAP is the SWAT Team; it is where the RAC has the most influence to make viable CHP installations a reality. The SWAT Team represents the composite of the applied technical knowledge available to the RAC. The SWAT Team provides assistance to remove perceived risk and to identify technical solutions for those installations where CHP would be well suited. The purpose of the SWAT Team is to foster the completion of CHP projects assessed as being High Impact Projects.

A graphical representation of the SWAT Team concept is depicted in Figure 2-1.

**Figure 2-1 SWAT Team Concept**



An overview of the Technical Assessment Program is provided in Appendix A.

Potential projects are screened to assess their overall impact on fostering the CHP market. This assessment is made on a case-by-case evaluation of the proposed project based largely on the application of the screening criteria as described in Section 4 and APPENDIX B. In general, a project would be considered to be a “High Impact Project” if it was:

- ◆ Well suited for the application for CHP, (thermal loads matched to recovery heat available from generation source);
- ◆ There were current or potential financial benefits that could be achieved from the application of CHP,
- ◆ The size of the application was reasonable, and
- ◆ There was the potential for repeatability or large market impact from the installation (could be applied to a class of similar installation sites).

## **2.2 Project Team Leaders (PTLs)**

Once a High Impact Project is identified and is in need of the RACs support, a SWAT Team is created and a Project Team Leader (PTL) is assigned. The PTL provides oversight assistance and support to the project. They will likely be required to visit the site and interact on a regular basis with site engineering and/or architectural personnel. Funding will be available for Project Team Leaders to work with clients.

PTLs are selected based on their knowledge and experience in the application of CHP technologies for a particular market sector and/or geographical location. Selection criteria for PTLs are explained in APPENDIX C. The RAC will maintain a list of PTLs, and be responsible for assigning them to projects.

## **2.3 Focus Experts (FEs)**

Focus Experts (FEs) are made available through the SWAT Team if special considerations or issues arise during the development of a CHP installation. Normally their services are requested by the PTL and they will be directed by the PTL to provide input on specific technical issues within their area of expertise. In order to minimize SWAT Team costs, in most cases the FEs are not expected to visit the site in order to render their services. Funding for FE assistance on an on-call and as needed basis will be available through the Midwest Application Center.

Focus Experts will be chosen based on their particular depth of knowledge for a given area of technical expertise. Examples of such areas of expertise might be: indoor air quality control systems, reciprocating engines, grid interconnections, etc. The Midwest Application Center and/or the National Steering Committee will select FEs based on the selection criteria given in APPENDIX C. The Midwest Application Center will maintain a national list of FEs.

## **3. LEVELS OF ASSISTANCE**

### **3.1 Overview**

The TAP is designed to facilitate technical support based on the overall impact of the project relative to mainstreaming CHP into the target market. The TAP is graduated into four general phases of assistance:

1. Standard Outreach
2. Investigation
3. Design-Bid, and

#### 4. Post Commission.

Requests for assistance may come into the RAC through various means, such as through the website, a personal contact, a phone call, or more likely from Local Project Champions (LPCs). All requests and inquiries that come into the RAC that are related to commercial, institutional, multi-unit residential, or light industrial projects are provided access to any information available on CHP that the RAC has and to general assistance from the RAC regarding CHP installation. This type of support is included in the Standard Outreach phase.

If the request represents a potential installation where CHP might be a viable option, it would be evaluated for thermal compatibility, financial feasibility, and its overall impact in the development of the CHP market. If the project meets the screening threshold (described in Section 4) and project assistance is desired, then a SWAT Team would be created and the project would progress into the other phases. The number of sites considered for technical assistance will be limited by the screening process and by the resources available to the RAC.

A general overview of the TAP is provided in APPENDIX A and discussed in more detail as follows:

#### **3.2 Standard Outreach**

The criteria for eligibility for support during this phase would be for the project to be preferably in one of the CHP target market segments.

Standard outreach assistance includes:

- ◆ An initial consultation with a Core Team member to discuss the feasibility of a CHP installation,
- ◆ A general technical and financial assessment for a potential CHP installation based on general assumptions, such as building type and size, electric profile, geographical location, and utility rate structure for the applicable service area, and
- ◆ Access to information available at the RAC, such as: brochures, case studies, prepared presentations, a screening tool for self-assessment, and access to the Midwest Application Center Information Repository.

This phase of support is estimated to encompass less than 5 hours of RAC personnel's time per site.

#### **3.3 Investigation Phase**

The criteria for eligibility for support during this phase would be to meet the threshold value given by the screening criteria for this phase as described in Section 4. In addition, either an architect or an engineering firm would need to be involved or being sought. Projects that enter into this phase are considered to be "High Impact Projects."

The Investigation Phase represents the first phase in which a SWAT Team would be created. In this phase, assistance would be provided in terms of the following:

- ◆ A Project Team Leader would be assigned,
- ◆ A site assessment/walkthrough may be conducted,
- ◆ An estimated technical assessment based on readily available site-specific information would be performed,

- ◆ An estimated financial assessment based on readily available site-specific information would be performed (*A payback analysis would be performed and a rate of return would be calculated.*), and
- ◆ Project justification assistance in order to obtain funding would be provided.

The information used during this phase to perform the technical assessment would be any readily available site-specific information pertaining to electric and thermal load profiles. The actual utilities rate structure for the application would be applied to perform the financial assessment. The assessments performed by the RAC during this phase are not intended to be a substitute for an engineering analysis, but rather a precursor to help determine if an engineering analysis is warranted.

This phase of support is estimated to encompass up to 20 hours of RAC personnel's time.

### **3.4 Design-Bid Phase**

The criteria for eligibility for support during this phase would be to meet the threshold value given by the screening criteria for this phase as described in Section 4, in addition to that in the Investigation Phase. In addition an architect and/or an engineering firm would need to be involved in the project, as well as proof that capital would be available to go forward with the project.

In the Design-Bid Phase, assistance would be provided in terms of the following:

- ◆ Focus Experts (FEs) would be available to the PTLs to address specific issues,
- ◆ A site-specific technical assessment based on the best site-specific information obtainable would be performed,
- ◆ A site-specific financial assessment including a payback analysis, a calculated net rate of return, and a present value analysis, would be performed,
- ◆ A standard bid specification would be drafted, and
- ◆ Bid evaluation support would be provided.

The information used during this phase to make the technical assessment would be the best available site-specific information pertaining to electric load and profile, and thermal load and profile as could reasonably be obtained. The actual utilities rate structure for the application would be applied to perform the financial assessment, in addition a client specified rate-of-return and discount rate would be applied. The type of assessments provided during this phase by the RAC are not intended to replace the need for a detailed engineering and cost analysis, but rather a first-cut justification to either go forward with the project or not.

This phase of support is estimated to encompass up to 50 hours of RAC personnel's time.

### **3.5 Post Commission Phase**

The Post-Commission Phase applies to those CHP installations in which the RAC has had any influence in the installation of a CHP system; it does not exclude those installations where SWAT Team assistance has not been previously provided. This phase will encompass the time period of approximately one-year post commission of the installation. During this phase the RAC will perform a Case Study of the installation using as much actual information as available. It is estimated to take up to about 20 hours of the RAC personnel's time.

## **4. SCREENING PROCESS**

### **4.1 Screening Software**

The RAC needs to be able to quickly assess the viability of a CHP installation in a particular building and to determine if further project assistance is warranted. At the current time screening software is being developed by GARD under the sponsorship of the DOE-OPT that will provide this quick assessment tool. Currently assessments are made utilizing up to three separate programs: the Gas Cooling Guide, DesiCalc (if desiccant dehumidification is being considered), and an Excel spreadsheet program developed by Midwest Application Center personnel. Only a couple of individuals can perform the assessments since the current assessment process is not user-friendly. Information from these assessments is used in the screening process to evaluate the level of project assistance to be provided.

### **4.2 Screening Criteria**

The screening criteria provide direction for the preliminary allocation of the limited resources of the RAC. The criteria are identified as applied to each phase of assistance in the screening evaluation sheets in provided in APPENDIX B.

The criteria are developed with the intent to be flexible so that they can be adjusted as the market conditions change to shift the focus of the projects chosen by the RAC to market sectors that are viable but have not been penetrated. This is necessary so that when there are sufficient applications in one market segment, the RAC resources will not continue to be allocated to that segment, or if a more desirable market segment is identified, resources can be redirected to pursue that market.

The criteria provide a general assessment guideline, however each installation should be assessed on a case-by-case basis, since special situations merit special consideration with some discretion.

### **4.3 Screening Assessment**

Each project that is considered viable by RAC personnel or a LPC is screened using the screening evaluation sheets in APPENDIX B. The screening tool provides information for thermal and electric compatibility (Technical Assessment) and payback (Financial Assessment) that is to be used in the evaluation. The more thermally and electrically compatible a project is, and the shorter the payback period, the higher the evaluation values. The screening threshold increases as the project progresses through the phases outlined in Section 2.

## APPENDIX A Technical Assistance Program Overview

### Standard Outreach Phase

STANDARD OUTREACH

- 1) Criteria:
  - a) One of the following market segments and evaluated by an Application Center Team Member to be consistent with the Recommendations and Action Plan given in that State's Baseline Analysis:
    - ◆ Commercial
    - ◆ Institutional
    - ◆ Multi-Unit Residential
    - ◆ Light Industrial
- 2) Assumptions:
  - a) General assumptions about building type (such as small hospital, large office, etc.) and size, and geographical location,
  - b) General utilities rate structure for applicable service area.
- 3) Services Provided:
  - a) Initial consultation.
  - b) General technical assessment (electric and thermal load compatibility).
  - c) General financial assessment (cost differential and payback period).
  - d) General information about CHP such as provided by the RAC on their website, in their brochures, case studies, and prepared presentations, as well as a screening tool for self-assessment, and information in the RAC repository.
- 4) Estimated Center effort -- < 5 hours of Center personnel's time.

### Investigation Phase

SWAT TEAM

- 1) Criteria: (See screening criteria in APPENDIX B for specific evaluation criteria.)
  - a) Selected building types (adjust points or exclude based on desired market penetration for that particular building type),
  - b) General Technical Assessment (more compatible gets higher points),
  - c) General Financial Assessment (more favorable gets higher points), and
  - d) Architect/Engineering firm involved or Architect/Engineering firm is being sought.
- 2) Assumptions:
  - a) Use as much site specific information readily available pertaining to:
    - i) Electric load and profile,
    - ii) Thermal load and profile, and
  - b) Actual utility rate structures.
- 3) Services Provided:
  - a) Project Team Leader assigned,
  - b) Site Assessment/Walkthrough,
  - c) Estimated Technical Assessment based on available site specific information,
  - d) Estimated Financial Assessment based available site specific information, and
    - i) Payback
    - ii) Rate of Return
  - e) Project justification assistance.
- 4) Estimated Center effort – up to 20 hours.

**Design/Bid/Bid Evaluation Phase**

- 1) Criteria: (See screening criteria in APPENDIX C for specific evaluation criteria.)
  - a) Initial CHP Assessment Report completed by PTL recommends project goes forward,
  - b) Client willing to go forward with full engineering evaluation for project installation,
  - c) Architect/Engineering Firm involved, and
  - d) Capital available to finance project.
- 2) Assumptions:
  - a) Obtain as much site specific information readily available pertaining to:
    - i) Electric load and profile
    - ii) Thermal load and profile
  - b) Actual utility rate structures,
  - c) Client specified rate of return, and
  - d) Client specified discount rate.
- 3) Services Provided:
  - a) Focus Experts available, as needed, to address specific issues,
  - b) Site specific technical assessment,
  - c) Site specific financial assessment including:
    - i) Payback,
    - ii) Rate of Return Net,
    - iii) Present Value Analysis,
  - d) Standard Bid Specification, and
  - e) Bid evaluation (estimated 10 hours)
- 4) Estimated Center effort – up to 50+ hours.

**Post Commission Phase**

- 1) Criteria: Any installation that has been influence by the Regional Application Center.
- 2) Assumptions:
  - a) As much real information as available should be used, per Case Study Protocol.
- 3) Services Provided:
  - a) Case Study.
- 4) Estimated Center effort – up to 20 hours.

**APPENDIX B      Screening Evaluation**

**Note:** Assignment of points for the Technical and Financial Assessments will be developed based on the screening tool output. Threshold values for the various phases of support will be established based on the development of the point assignments.

The evaluation criteria should be considered for each phase of assistance as indicated.

**General Information Phase**

One of the following market segments:

- ◆ Commercial
- ◆ Multi-Unit Residential
- ◆ Institutional
- ◆ Light Industrial

AND

Evaluated by an Application Center Team Member to be consistent with the Recommendations and Action Plan given in that State's Baseline Analysis.

**Investigation Phase (High Impact Projects)**

Criteria	Weight*	Rating	Total
Selected building types: <i>(* Adjust weight based on desired market penetration for that particular market sector as provided in the Recommendations and Action Plan given in that State's Baseline Analysis)</i>			
Hospital	TBD		
Large Hotel	TBD		
Small Hotel	TBD		
Office Building, High Rise	TBD		
Office Building, Low Rise	TBD		
School	TBD		
Nursing Home	TBD		
Supermarket	TBD		
Restaurant, Full Service	TBD		
Restaurant, Quick Service	TBD		
Retail Store	TBD		
Refrigerated Warehouse	TBD		
Theater	TBD		
Ice Arena	TBD		
Data Center	TBD		
General Technical Assessment <i>(More compatible gets higher points)</i>	TBD		
General Financial Assessment <i>(Shorter payback gets higher points)</i>	TBD		
<b>Total</b>			
<b>Threshold:</b>	<b>TBD</b>		
Architect/Engineering firm involved or Architect/Engineering firm is being sought	<b>Go or No Go</b>		

## Design-Bid Phase

<b>Criteria</b>	<b>Weight</b>	<b>Rating</b>	<b>Total</b>
Initial CHP Assessment Report completed by PTL recommends project goes forward	<b>Go or No Go</b>		
Client willing to go forward with full engineering evaluation for project installation	<b>Go or No Go</b>		
Architect/Engineering firm involved.	<b>Go or No Go</b>		
Capital Available to finance project	<b>Go or No Go</b>		

## APPENDIX C

### Support Personnel Selection Criteria

#### Selection Criteria for Project Team Lead (PTL)

- Individual should be familiar with the design of CHP systems and have experience with the applied technologies, equipment selection and sizing, and installation of CHP systems.
- Individual should be selected from universities, engineering firms, or other professional service firms that have experience with the installation of CHP systems.
- Individual should be employed by firms or universities within the State of the project and should be familiar with local codes and standards applicable to the project.
- Individual should be familiar with applicable utility and energy service rates that apply to the project.
- Individual should understand the costing and financing associated with the project and should be able to communicate critical financial information.
- Individual should be acceptable to the owner of the building (or the individual responsible for the project).

#### Selection Criteria for Subject Matter Experts (SMEs)

- Individuals should be known experts within their area.
- SMEs should be acceptable to the PTL and the owner of the building (or the individual responsible for the project).