Innovative Contract Vehicle to Accelerate Campus Energy Savings

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Thursday February 28th, 2019

Spoiler Alert: Temple selected an Energy Projects Construction Manager (EPCM) to Accelerate Campus Energy Savings

- This presentation focuses on why an EPCM was chosen by Temple as the contract vehicle
- We will detail some of the pros and cons of this vehicle versus others
- Another spoiler: it has generally been a successful engagement and we would probably do it again.

Introduction to Temple University

- Temple operates two large campuses in economically challenged North Philadelphia (plus several satellites both US and international)
- Main Campus 78 bldgs., 8,561,032 GSF
- Health Sciences Campus 2 miles north of Main, 30 bldgs. 3,844,221 GSF (including hospital)
- Total undergraduate enrollment of 29,550 students
- Continued growth in all areas

Introduction to Temple University (Cont…)

- State-related university receiving some portion of funding from Commonwealth of Pennsylvania
- Total energy expenditure including Hospital is about $26.5million/year
- Hospital is a separate legal entity but buys all energy products through university
- The Hospital was not part of this energy-savings procurement, choosing to pursue their own savings endeavors

Temple's Position Relative to Center City Philadelphia – about 2 miles north of City Hall

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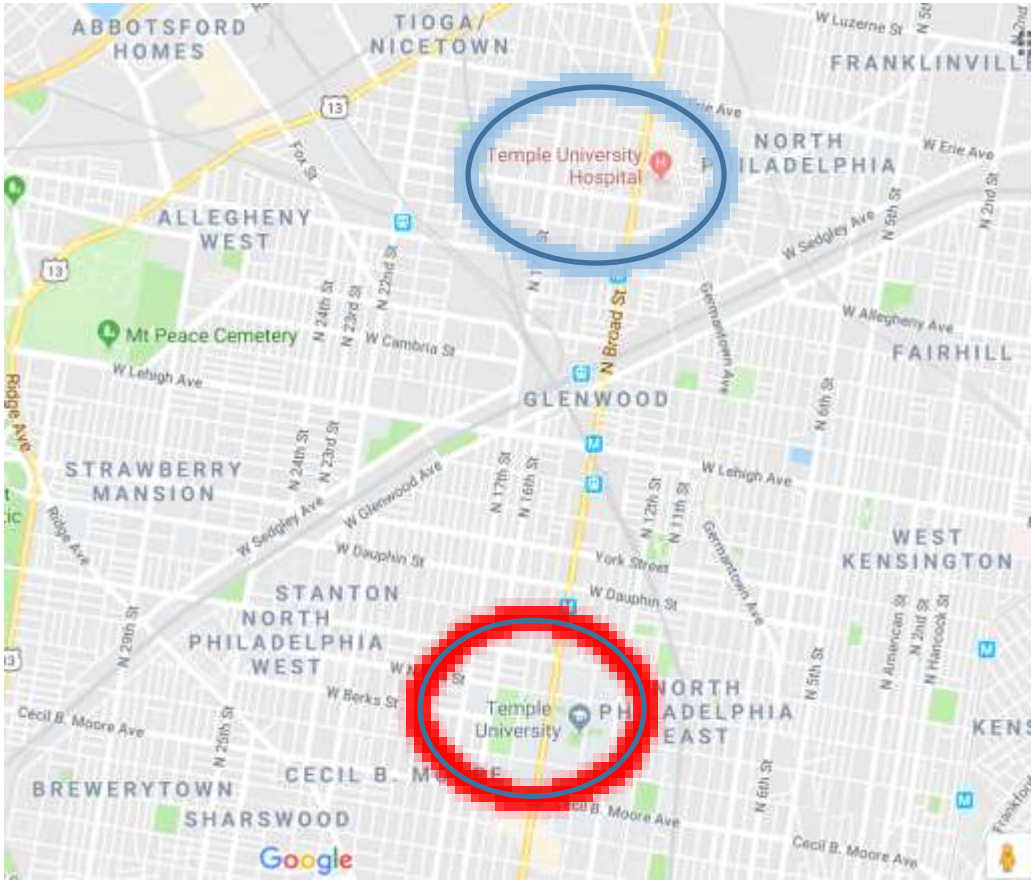
Temple Main Campus and Health Sciences Campus – separated by about 2 miles.



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Brief Introduction of Myself

- BS in Applied Physics and Electronics
- MS in Information Science
- Energy engineer since 1988, licensed PE in PA, passed the CEM in early 1990s, LEED AP since early 2000s
- Worked for consulting energy engineers, then an ESCO, then had my own energy engineering practice that I sold, then worked at another ESCO (including winning the EPCM at Temple) then…
- …Energy Manager at Temple since August 2015

A Need for Successful Projects – A Desire for Transparency and Value

- In 2014 climate action planning and a desire for change freed up about $11million in funding for energy projects
- At that time Temple's Energy Office was only approximately 1.3 people
- Any implementation would need to effectively leverage existing staff
- Needed good value

Anatomy of a Typical Energy Project

- Successful energy projects incorporate many facets – major differences from normal facility upgrades
- Proper identification and scoping
- Surveys, measurements, savings calculated
- Constant and consistent project (re)qualification
- Initial findings written up with calculations and initial project estimating

Anatomy of a Typical Energy Project (cont…)

- In most cases there is more than one solution to solving a deficiency

Anatomy of a Typical Energy Project (cont…)

- If the preliminary steps look promising then sink more time and money into development
- When these look good then onto final design and engineering, submission of documents to authorities
- Conduct bidding and receive bids, descope, value engineer

Anatomy of a Typical Energy Project (cont…)

- Coordinate with the end customers regarding service disruptions to their spaces during the project
- Review all shop drawings and manage the construction work on a daily, even hourly basis, including night shifts
- Review invoicing and perform project accounting
- Manage or perform measurement and verification to ensure savings are being realized and write up findings
- Chase down the operating and maintenance documents from contractors prior to closing out the project

Anatomy of a Typical Energy Project (cont…)

- And all the other steps that need to be managed
- Temple of course has strict procurement rules through legal and purchasing departments
- So in light of this context we can evaluate the pluses and minuses of the different contract vehicles

Contract Vehicles Available

- For Temple, the overall available contracting vehicle choices could be any of the following:
  - In-house engineering and installation labor
  - Bid and spec
  - ESCO project using ESPC/Performance Contract/GESA
  - EPCM, specialized Energy Projects Construction Manager also known at other institutions as a “Design-Build Energy Services Program”

Acronym decoder: ESCO=Energy Services Company, ESPC=Energy Savings Performance Contract, GESA=Guaranteed Energy Services Agreement, EPCM=Energy Projects Construction Manager

Considered: In-House Design Engineering and Labor

- Temple has a project delivery group (PDG) so why not utilize the skills of those staff?
- PDG could manage bidding, project management and project accounting
- Still project scoping, surveys, calcs, specs
- So still a lot of work for the (then) understaffed Energy Office
- PDG was busy, already operating with full project loads

In-House

Acronym decoder: PDG=Project Delivery Group

Considered: Bid and Specification Procurements

- Most of Temple's large projects are bid and spec so why not?
- Some of the bid and spec challenges:
  - Limited internal engineering and project management resources
  - Recurring issues – scoping, surveys, calcs
  - Each contract has to go through purchasing and legal and those groups have their own staffing constraints
  - And there's project accounting all the way through, too

Considered: Bid and Specification Procurements (Cont…)

- Some of the good in bid and spec…
  - Institution is 100% in control
  - Institution gets the project you and your engineers design
  - Bid everything, so theoretically the efficient market always gives you best pricing
  - Or you can let a few large prime contracts and hope to get qualified subs and work

Considered: Bid and Specification Procurements (Cont…)

- Temple would have had to hire additional in-house resources to scope projects and manage the external engineers and the internal processes
- In the end bid and spec was not deemed practical for Temple's desired rapid pace of investment

Considered: An ESCO Performance Contract?

- The ESPC Good:
  - No financial outlay for the host facility
  - Limited personnel commitment in developing projects
  - Guaranteed energy savings potential with M&V
  - The facility can unload some risk to the contractor
  - Price certainty of the developed projects
  - ESPC/GESA will likely satisfy competitive bid requirements

Acronym decoder: ESCO=Energy Services Company, ESPC=Energy Savings Performance Contract, GESA=Guaranteed Energy Services Agreement

Considered: An ESCO Performance Contract? (Cont…)

- The ESPC not so good:
  - Multiple companies engaged in competitive bid cycle
  - Limited ability to stage Energy Conservation Measures
  - Project needs a good blended payback
  - Limited complexity of projects
  - You will never really know what markups you are paying

Acronym decoder: ESCO=Energy Services Company, ESPC=Energy Savings Performance Contract, GESA=Guaranteed Energy Services Agreement

Considered: An ESCO Performance Contract? (Cont…)

- Industry experience says ESCOs try to “sell it at 20%, build it at 30%”
- Performance risk is still largely borne by the facility
- The decision taken at Temple was that an ESPC was not a great fit

Acronym decoder: ESCO=Energy Services Company, ESPC=Energy Savings Performance Contract

Utilized: An Energy Projects Construction Manager – an EPCM

- Specially written, focused energy efficiency contract vehicle released in 2014
- Also known at other institutions as an Energy Savings Program Design-Build Contractor
- Satisfied Temple's bid requirements with a single procurement
- Competitively bid margins and hourly fees

Acronym reminder: EPCM – Energy Projects Construction Manager

Utilized: An Energy Projects Construction Manager – an EPCM (Cont…)

- Outside engineers narrowed the list of prospective projects
- Five potential projects gave a way to gauge contractor approaches and meet their people
- Gave university open book pricing, agreed upon fees and markups
- EPCM contractor bids out each project and we see the results

Acronym reminder: EPCM – Energy Projects Construction Manager

Why this route to savings? The EPCM Model Used at Temple

- The selected route provided fast time to implementation – with other benefits that we'll cover next

Acronym reminder: EPCM – Energy Projects Construction Manager

Why this route to savings? The EPCM Model Used at Temple

- Competitive selection:
  - Qualifications step reduced the field to three firms
  - They bid on a menu of predetermined ECMs (Energy Conservation Measures)
  - Each firm agreed to open books, agreed to show billing rates, agreed to fixed, disclosed margins
  - They bid each project and we see the bids
  - They have specialized energy engineers, construction managers and back-office support all focused on energy savings projects

Acronym reminder: EPCM – Energy Projects Construction Manager

Why this route to savings? The EPCM Model Used at Temple (Cont…)

- Projects were done with in-house funding
- Each project stood alone, no pressure to implement all as a package
- At peak Temple was spending probably 2.5 to 3 full-time employee days per week on managing this contract – significant

Acronym reminder: EPCM – Energy Projects Construction Manager

Why this route to savings? The EPCM Model Used at Temple (Cont…)

- Successfully implemented $11million of varied projects over 3.5 years
- Temple controlled the implementation carefully
- Kept strict control of the timelines and procedures for:
  - Surveying
  - Engineering and Calculations
  - Permitting
  - Implementation – Scheduling
  - Finances

Decisions

Acronym reminder: EPCM – Energy Projects Construction Manager

Which Route May Be Best for You?

- Use of external finance could affect project staging
- This EPCM-type design/build vehicle most likely suits customers who have internal engineering, project management and dedicated accounting personnel
- Due to a la carte options there are many, many decision points = management time

Acronym reminder: ESPC – Energy Savings Performance Contract, EPCM – Energy Projects Construction Manager

Which Route May Be Best for You? (Cont…)

- Assuming suitable projects are available then consider:
  - Funding – budget or borrow?
  - Savings – who will produce these?
  - Bidding – either the ESPC or EPCM route allows a single, intensive bid process (at least it did for Temple)
  - Project management meetings – someone has to be watching

Acronym reminder: ESPC – Energy Savings Performance Contract, EPCM – Energy Projects Construction Manager

Which Route May Be Best for You? (Cont…)

- There is no one-size-fits-all – Internal capabilities, funding, staff levels
- Some facilities will be best with a single ESCO project – simpler to administer but at some cost
- Others with a full complement of engineers and PM staff might find bid and spec works well

Acronym reminder: ESCO=Energy Services Company, ESPC=Energy Savings Performance Contract, GESA=Guaranteed Energy Services Agreement

Which Route May Be Best for You? (Cont…)

- The ESPC and EPCM are both rapid, the ESPC would be more hands-off
- The open book nature of the EPCM deal created a partnership feel, we see all pricing and documents
- Bid and spec or internal implementations would work well if improvements are part of normal upgrade cycles
- At the end of the day, the facility owns it so someone needs hands-on

Acronym reminder: ESPC – Energy Savings Performance Contract, EPCM – Energy Projects Construction Manager

Results in Round Numbers

- Approximately $11million invested since 2015. Of that total:
  - Over $8million went to materials and subcontractors (we see the invoices)
  - Over $600,000 to design and engineering fees
  - About $2.5million to other fees and services such as contractor markup, construction management, start-up and commissioning, M&V, rebate applications
- Verified about $1.8million annual savings over multiple campuses
- Some sample projects follow

Project: Lab Exhaust VFDs at Medical School

8@75 HP, 5@60 HP = 900 HP of VFDs and sophisticated modulation and staging controls, $500,000 net investment with $136,000 savings

Project: Insulating Blankets Multiple Buildings

Removable blanket insulation, and steam traps approx $1.75million invested, 6.0 year payback

Project: Reduce Simultaneous Heating and Cooling

Air handler improvements to reduce preheat use included these freeze protection pumps on chilled water coils.

$900,000 investment, $200,000 annual savings.

Wrap-Up

Acknowledgements and thanks

Questions?

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