APPENDIX B

YEAR ONE ACTIONS AND ACCOMPLISHMENTS – INFRASTRUCTURE DEVELOPMENT

The first year of the Energize Phoenix program involved developing the base infrastructure between and within the partner institutions upon which the future success of the program will be based. The complexity, effort, and elapsed time involved in building such infrastructure should not be underestimated in any decision to undertake such a program that capitalizes on expertise between established organizations. Major actions and accomplishments in the first year include:

CREATION OF INTER-GOVERNMENTAL AGREEMENTS AND INTER-INSTITUTIONAL MEMORANDUMS OF AGREEMENT

On April 5th, 2011, eleven months into the project, APS and ASU signed their MOA. Creating an IGA and the MOAs among institutions constituted the longest total elapsed time of any Year One task. The sequencing of agreements involved:

- The City of Phoenix (CoP) and ASU developing and signing an Inter-Governmental Agreement (effectively an ASU grant sub-contract from CoP) which had to be approved by the Arizona Board of Regents and the Phoenix City Council;
- A CoP-APS Memorandum of Agreement, detailing partner roles and responsibilities, which also required Phoenix City Council approval;
- An ASU-APS MOA detailing data sharing for program evaluation and analysis.

Perhaps the most significant hurdles in negotiating these agreements centered on liability (program liability and customer data privacy) and the potential exposure of APS proprietary business processes.

IDENTIFICATION OF INSTITUTIONAL DEPARTMENTS INVOLVED

Beyond the primary project team members assigned by each institutional partner, many other departments were involved to varying degrees because of process needs or because of particular expertise. These included (so far):

City of Phoenix

- **Public Works** – Design and management of the overall program and of the commercial programs
- **Neighborhood Services Department** – Design and management of the residential programs, as well as community outreach
- **Community and Economic Development** – Development of the commercial and residential financing programs
- **Finance** (including Controller, Purchasing and Risk Management) – Approval of the rebate check process, disbursement of rebate checks and contractor payments, assistance in the design of the financing program, and procurement of the energy dashboards, and review of program for risk management impacts
- **Law** – Assistance with development of and approval of all contract and application language. Negotiation of liability issues between partners.
- **Labor Compliance** (entity within Street Transportation) – advisement, compliance and reporting on the Davis-Bacon and Related Acts
- **Human Resources** – Posting, recruiting and hiring of Energize Phoenix staff positions
- **Historic Preservation** (within Planning and Development Services) – Development of historic preservation review process guidelines, compliance with National Historic Preservation Act, identification of historic properties and review of projects
- **Planning and Development Services** – Advisement on plan review, permitting and inspection requirements
- **Phoenix Workforce Connection** (within Community Economic Development) – Advisement on resources available to contractors, including assistance with staffing needs and job training opportunities
- **IT** (including GIS) – Co-development of building address look-up tool (to determine if a building is within the Corridor boundaries)
- State agencies that were used as resources in program design and management include the **Registrar of Contractors, AZ Industrial Commission and the Board of Technical Registration**

Arizona State University

- **Global Institute of Sustainability Business Services Office** – Budgeting, accounting, equipment procurement, hiring, payroll

- **Office of Knowledge Enterprise Development (OKED)** – Grant administration, Inter-governmental agreement negotiation, MOA coordination, ARRA reporting
- **Office of Research Assurance and Integrity** – Approval of all elements of human subjects research (surveys, dashboard study)
- **Legal** – Negotiation of liability issues and approval of contract language
- **Human Resources Employee Services Center** – Management of employee fingerprinting and background checks for contact with vulnerable populations
- **College of Engineering, Seidman Research Institute, School of Geography, School of Design, and WP Carey College of Business** – Team members with subject matter expertise as well as budgeting, payroll and accounting for them.
- ASU also contracted with **Denise Resnik and Associates** for program marketing, as well as interfaced with the Maricopa County Assessor's office for property data

Arizona Public Service

- **Solutions for Business™** (and KEMA International as a contractor) – Advisement and co-development of the non-residential programs
- **Marketing** – Advisement on and co-development of the residential Rebate Match program, data sharing
- **Arizona Home Performance with Energy Star (AZHPwES)** (a program of the Foundation for Senior Living) – management of the base program upon which the Rebate Program is built, training of contractors
- **Conservation Services Group (CSG)** (contracted provider of the AZHPwES reporting software) – assistance with data extraction and sharing
- **Legal** – Negotiation and approval of all contract language
- **Meter Department** (management and customer service) – Rescheduling of smart meter replacement such that the Corridor was retrofit prior to the start of the Program
- **Community Development and Relations** – Management of relationships with ASU and City of Phoenix
- **Communications** – Approval of APS logo usage for all marketing materials
- **Federal Regulation** – Advisement on potential Davis-Bacon Act applicability
- **Customer Service Management Group** – Ensuring that potentially-eligible customers are referred to Energize Phoenix program staff or resources by the in-bound customer call center
- **IT** – Assistance in designing billing database queries
- **Regulatory** – Advice on Energize Phoenix program impacts on compliance with State regulations.

DEVELOPMENT OF PROCESS FLOW CHARTS

Primarily developed by CoP and APS to coordinate their project application processing, flow charts were created for both the residential and non-residential incentive programs. Though the initial design path envisioned a hand-in-hand joint process, legal issues regarding commercial program information sharing eventually caused a re-design into separate, parallel processes for the business programs. Significant effort went into coordinating partner hand-offs to minimize approval times and participant complexity.

IDENTIFICATION OF AND HIRING FOR UNFILLED POSITIONS/ROLES

The hiring and immersion of key project personnel also consumed elapsed time in developing the details of the Program:

- **City of Phoenix** – In the first year, CoP transferred its Energy Manager to the project and hired an overall Project Manager, a Management Assistant, a Project Manager for the residential programs, an Energy Engineer, a Community Worker for residential outreach, a Rehab Specialist for technical, field and construction residential program needs, and a Business Assistance Coordinator to develop the financing programs.
- **ASU** – ASU hired a full time Project Manager and eleven students as part-time Community Surveyors. ASU also assigned a full time Data Management Analyst, nine part-time Principal Investigators from a wide range of specializations, and six part-time graduate research assistants.
- **APS** – APS did not hire any staff specifically for the Energize Phoenix program, but did hire additional staff to handle its rapidly expanding energy efficiency programs. Growth happened faster than hiring, thereby increasing workloads on existing team members and increasing turnaround times somewhat for program design decisions and project approvals.

Due to APS' relationships with an existing contractor industry, the need for contractor job training (which many other BetterBuildings programs have experienced) has been minimal. If that were not the case, Energize Phoenix would be working with local Workforce Investment Act programs such as Phoenix Workforce Connection (PWC) to train contractors. Currently, the City refers contractors to PWC for any job skills training need for their staff.

DEVELOPMENT OF CUSTOMER AGREEMENTS

At three pages for the residential Rebate Match application and six pages for the commercial participant application, the Energize Phoenix customer agreements are relatively short by City standards. While they may still seem elaborate to citizens upon first read, getting them to this length while also including all the necessary federal, State and City requirements was an involved process. One hurdle was that the City Finance department is set up to pay vendors for work performed. The Rebate Match and commercial programs, conversely, were designed to pay homeowners and businesses a rebate on work performed for them by a third party. Finance is not set up to issue rebate checks (which don't involve invoices). The Rebate match and commercial programs were designed to be market-oriented, private sector-driven programs, in contrast to the City-managed 60/40 and Rental programs. If the City had opted for program designs in which it *hired* contractors to do the work, then procurement processes (multiple bids, etc) and the complexities of Davis Bacon Act provisions would have come into play. The private sector-driven programs would have become overly cumbersome for contractors and, as-such, un-marketable. Working out solutions for a unique program structure required time investment and good inter-departmental relationships.

DEVELOPMENT OF PARTICIPATING CONTRACTOR TERMS AND CONDITIONS

Another first year milestone accomplishment was the development of the residential and commercial Energize Phoenix Contractor Terms and Conditions, which were approved by the City Law department in early 2011. The terms and conditions were also unique for the City in that they are agreements to deliver information (and govern behavior) for free, rather than to provide a physical service for a fee. Contractors are not paid by the City. The nature of this unusual arrangement presented new situations to the City Law department vis-à-vis its typical contracting language.

UNDERSTANDING AND ADAPTATION OF DOE REPORTING REQUIREMENTS

As DOE was ramping up its own BetterBuildings infrastructure in parallel with the launching of a diverse portfolio of BetterBuildings grantees in the field, much of the DOE data needs were also being defined *during* Year One. Additionally, as DOE's role is in aggregating data from diverse projects, it is inevitable that some data needs do not apply to a particular program or that available data does not fulfill the DOE intent. These discrepancies take time to resolve and sometimes cannot be fully resolved in a manner that makes the data the most meaningful relative to what is practically happening at the individual building level. ASU intends to develop case studies, a component of which will be to fill in some of the meaning gaps in the data using specific projects.

DEVELOPMENT OF WASTE STREAM/NEPA REPORTING, DAVIS-BACON, AND BUY AMERICAN PROCESSES

Other federal, state and City regulations and practices generated additional needs for infrastructure development. The City of Phoenix has a long history of environmental stewardship in the conduct of all facets of City business. As such and per federal requirements, Energize Phoenix developed a waste stream management plan for contractors to follow and a simple mechanism for contractors to track and report the disposition of project waste. As most energy efficiency upgrades do not involve the disturbance of soil, DOE issued "bounded categories" to exclude from BetterBuildings programs projects that would involve the disturbance of soil, thus eliminating the need for more involved EL-1 NEPA assessments and reporting.

Determining to which programs the Davis Bacon and Related Acts applied, how it applied, how contractor reporting would work, and training contractors on those requirements was a time-intensive endeavor. Uncertainty also came into play when DOE guidance changed, well into the infrastructure development process. Arizona also has State laws that prohibit conducting business with Sudan and Iran, so clauses to that effect needed to be included in the City's terms and conditions for contractors.

DEVELOPMENT AND DELEGATION OF HISTORICAL PRESERVATION PLAN

Federal and City requirements and goals necessitated compliance with the National Historic Preservation Act. Because the activities of the BetterBuildings programs

are fairly closely aligned with activities of the federal Weatherization Assistance Program, DOE contacted the State Historic Preservation Offices (SHPO) to encourage applying the existing historic preservation Programmatic Agreement between DOE, the State Energy Office and SHPO to BetterBuildings programs. The City's Historic Preservation Office then wrote a letter to Arizona's SHPO detailing what the historic preservation policy would be and requesting that authority to carry it out be delegated to the City. DOE wrote a letter of support as well. SHPO needed to approve this policy and did. Then, the City's Public Works and Neighborhood Services departments needed to execute inter-department MOUs with its Historic Preservation Office to detail mutual responsibilities. The MOUs were executed in July, 2011.

Any Energize Phoenix project that takes place on a historic property or in a historic district requires a review and approval from the Historic Preservation Office. Many residential projects involve mostly work inside the house and, as the office works to protect the exterior aesthetics of historic properties, those projects do not have historic preservation impacts. Also, since Energize Phoenix does not incentivize window replacement, the potential conflict with historic windows is minimized. However, the office will most likely deny activities such as attaching shade screens to street-facing windows, placing solar panels on street view rooflines, and moving air conditioners to street view rooflines or grounds.

DEVELOPMENT AND DELIVERY OF CONTRACTOR TRAINING

Energize Phoenix conducted its first two contractor orientations (commercial and residential) in October, With many of the program and process details still being worked out, they both proved to be a prime opportunity to get contractor feedback on elements of the process and on potential participation show-stoppers. City of Phoenix, APS and ASU representatives all participated. Questions centered on the 60/40 program, the start dates of the programs, and whether projects that were to begin before the official start date would qualify (No). The give and take atmosphere with more than 70 experienced contractors proved very productive, identifying potential improvements as well as structural issues with the 60/40 program that would result in contractors feeling dis-incented to inform homeowners about it. This resulted in a 60/40 delivery re-design that has Energize Phoenix and Neighborhood Services staff planning to drive the marketing of the 60/40 program with City-hired contractors performing energy assessments. While some contractors were reluctant to speak openly in front of their competitors, the pro-active decision to involve contractors before program details were locked proved to be a time-saving measure and improved program design.

A follow-up mandatory commercial contractor training was held on November 16th, 2010 and repeated again on March 16th, 2011. Several contractors that attended the November session were approved in January, 2011. The three contractor requirements for Energize Phoenix are: 1) to be on APS' approved contractor list, 2) have submitted a complete, approved Energize Phoenix contractor agreement, and 3) to attend a mandatory contractor training. As of June 1, 2011, there were 43 approved commercial contractors. Energize Phoenix expects to hold one more training in September, 2011 for any additional contractors that want to participate.

Residential contractor orientation was held on October 14th, 2010 and trainings were held on January 6th and April 7, 2011. Participation rates were considerably lower, with concerns repeated about the 60/40 program both with having to bid on projects that the contractor may have generated and with Davis-Bacon and Related Acts reporting requirements. Contractors also expressed concerns with uncertainty over which types of activities required permitting. As of June 1, 2011, seven contractors were approved to participate in the Rebate Match Program and the city had contracted with two firms to conduct energy assessments and develop scopes of work for the Rental and 60/40 programs.

Rental and 60/40 program contractors need to be approved by City Council because they are performing contracted work directly for the City.

NEGOTIATION OF FINANCING PROGRAM

In early October, 2010, The City of Phoenix issued an RFQ to local banks to establish a commercial revolving loan fund and a financing program for the 60/40 program. Negotiations began in November with National Bank of Arizona (NBIAZ) on both the residential and commercial side but, in February 2011, NBIAZ declined to participate in residential components. Negotiations continued between NBIAZ, Community Economic Development, Finance and Law on the commercial revolving loan fund with reformulations along the way as IT infrastructure roadblocks and differences in business models were encountered. DOE reporting requirements also posed challenges with customer and bank data privacy policies. As of June 1, the City and NBIAZ were nearing finalization of an agreement.

For the residential loan component, the City decided to pursue a Request for Proposal (RFP) specifically for a loan service provider and/or financial institution. The RFP is expected to be available by mid - August 2011. The DOE financial team is also providing assistance.

CREATION OF BRAND STRATEGY, BRAND, MARKETING STRATEGY, TACTICS AND MARKETING MATERIALS

Vital to the success of the Energize Phoenix program is a strong marketing campaign that, through a combination of tactics, helps build awareness and assists in raising participation numbers. Denise Resnik and Associates (now DRA Strategic Communications or "DRA") was selected to fulfill these needs. DRA first identified the stakeholder audiences (community influencers and residents and businesses inside the Corridor, as well as those throughout Phoenix. Key messages were developed regarding the program, energy and financial savings, green jobs, and community pride. DRA's overarching strategy has been to build a branded identity that promotes energy conservation as a social norm. The challenge involves overcoming historical reactions to energy efficiency programs, which include confusion and intimidation. DRA has tackled this by creating a brand that is approachable and fun, and by emphasizing clean, concise and non-technical language in marketing materials.

The marketing campaign was initiated on October 26th, 2010, with a press conference attended by media and key stakeholders, who also received a press kit created for the event. The content-dynamic program website (Energizephx.com) and a promotional video were unveiled at the press conference. Since, a portfolio of collateral and support materials such as brochures, fact sheets, yard signs, contractor ID badges, banners, postcards, event giveaways and window decals have been produced and distributed. Additionally, a media campaign has included developing and delivering story pitches to local publications. A feature in a key Corridor publication, Light Rail Connect, was recently published and other placements are in the works. An advertising campaign was rolled out in the summer of 2011 highlighting the concept "With the money you save on your utility bill you can buy the things you want." In the coming years, the media approach will include a focus on *Energy Superheroes* (program participants who serve as role models and provide testimonials) and social media campaigns, as well as targeted media buys and partnerships with local Hispanic community programming to continue to build the EP brand and awareness level in the Corridor and in greater Phoenix.

DEVELOPMENT OF ROBUST PROGRAM EVALUATION CRITERIA AND METHODS

ASU's cross-disciplinary team started with its Statement of Work and transformed it into a series of research questions, such as "Which retrofit recommendations are more likely to be implemented? Do they statistically associate with cost, contractor, invasiveness, homeowner characteristics, ROI, type of home, etc?". These questions were then sorted into five categories: Aggregate, Residential, Commercial, Contractor, and Dashboards and tagged according to which disciplines would take the lead on answering the questions and which other disciplines would be involved as support. Data needed to answer each of the questions was identified, as well as whether the evaluation protocol would involve statistical analysis, a review of research literature, qualitative analysis, or development of a case study. Project timeframes for answering each question was assigned, and the resulting framework has served as an overall project plan for the program evaluation.

IDENTIFICATION, SOURCING AND STRUCTURING OF EVALUATION DATA

Data needed to answer each of the program evaluation questions and to fulfill DOE reporting requirements includes existing data from government and utility sources as well as data to be generated by the program.

Existing sources include Maricopa County Assessor files, U.S. Census Data, NAICS, APS' billing system, the American Community Survey, and the Maricopa Association of Governments. Structuring this data in usable form involved finding or creating common data keys, cleaning data, dealing with overlap (some data overlapped the Corridor boundaries), and understanding meaning and limitations in the source data.

A diverse portfolio of new data was also identified as needed. Sources include data generated by the various applications (APS applications, contractor applications, customer applications), as well as the behavioral surveys created by ASU and the tracking sheets for the administration of those surveys. Additional data was to be generated by contractors using the home audit software that powers the AZ Home Performance with Energy Star program and by the Dashboard team's work. ASU also conducted a commercial contractor survey to better understand contractor characteristics that might influence program outcomes.

Ultimately, a flexible data platform was chosen and structured to provide for data evolution, security, and access

by the various researchers who need different data sets to answer their program evaluation queries.

DESIGN AND IMPLEMENTATION OF ENERGY DASHBOARDS PROGRAM

The Dashboards Team encountered an early challenge in attempting to run a human behavior change experiment inside the Corridor: A homeowner might get an energy upgrade to their home at any time, thereby significantly altering their energy consumption and skewing results. The team quickly changed gears and developed the idea to work with renters, a group that has not been previously engaged in energy feedback studies. Since landlords of single family rental homes do not qualify for Energize Phoenix incentives (note that they still qualify for APS programs), renters present an interesting opportunity to see how energy usage behavior can be impacted by people who pay their own utility bills but have limited authority to make physical changes to their homes. How much can they save? Will they influence their landlords to make improvements? Will they make their own limited improvements?

The full design of the Dashboard Program and the research of previous energy feedback studies that informed it can be found in Appendix I: Research to Inform Design of Residential Energy Use Behavior Change Study.

DESIGN AND ADMINISTRATION OF PRIMARY BEHAVIORAL DATA SURVEY

One of the first tasks the ASU cross-disciplinary team undertook was to develop demographic and attitudinal surveys for both residents homeowners and businesses in the Corridor. Some of the attitudinal questions are geared toward understanding economic and environmental motivations for conserving energy.

It was important to administer the surveys before the marketing for the programs got underway in order to gather baseline attitudinal data before Corridor exposure to program marketing messages. After vetting by the team, the surveys were submitted to the university's Institutional Review Board (IRB) for review and approval. After approval by IRB, the surveys were translated into Spanish and those translations submitted for approval. Accompanying the surveys were English and Spanish versions (both commercial and residential) of a consent letter and an Energy Data Release developed by APS, ASU and the City of Phoenix and approved by legal departments. The release, to be signed by an APS customer, permits APS to provide the customer's historic and future energy data to ASU and the City of Phoenix for analysis and for DOE reporting.

ASU hired eleven undergraduate students, put them through human subjects research training and a background check and then trained them on the Energize Phoenix project and on surveying protocols. Door-to-door address lists were generated by the project team's data manager using Assessor data. The Behavioral Team sorted neighborhoods into Socio-Economic Status (SES) groups and then randomized the neighborhood canvassing order in case the surveyors could not reach all neighborhoods. The GIS team then used satellite images to generate walking maps for the surveyors. Over approximately a ten week period, teams of residential surveyors and commercial surveyors canvassed most of the Energize Phoenix Corridor to administer surveys and collect waivers.

A description of the preliminary survey results date can be found in the Appendix J: Behavioral Survey Design, Administration and Preliminary Results.

DEVELOPMENT OF COMMERCIAL BUILDING PROJECT EVALUATION TEMPLATES AND CASE STUDIES

To create a systematic method to evaluate commercial energy upgrade projects, the Commercial Energy Analysis team developed a standardized project template that includes project information, contractor estimates of energy savings, historical usage data, and a placeholder for future usage data (as it becomes available). Developing a concise template to accommodate the range of Energy Conservation Measures (ECMs) employed, as well as the range of APS programs under which they are submitted (Express Solutions, Prescriptive, and Custom) was a challenge. One hurdle encountered early in the development process involved gathering contractor estimates of energy savings (needed for DOE reporting). While Express Solutions and Custom applications involve estimates, APS' prescriptive program pays set rates for different ECMs and does not require contractors to estimate energy savings. This gap was bridged by the City of Phoenix developing a spreadsheet for the contractor to report savings estimates for prescriptive application projects.

The team then applied the template to the first 17 projects completed and also began to develop a case study on the most complex upgrade project in the program. The results are presented in detail in Appendix F: Energy Analysis (Non-Residential).