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Assessment and Development of Recommended Framework Final Report

September 13, 2009

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ASSESESMENT AND DEVELOPMENT OF
RECOMMENDED FRAMEWORK
FINAL REPORT

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EXECUTIVE SUMMARY

On May 25th, 2009 the USAID-funded Economic Development Program SABEQ issued a report on “Green Building Codes Assessment and Development of Recommended Framework” and distributed it to all relevant stakeholders from both the public and private sectors for review and feedback.

On July 7th, 2009 a workshop was conducted with the participation of representatives of the stakeholders. The purpose was to present and discuss the findings of the report and the proposed recommendations. The intent of the workshop was to reach a consensus on the most applicable approach for Jordan to adopt in order to enhance the green movement through "building green". During the workshop, two different approaches were presented to the participants highlighting both the advantages and disadvantages of each approach. After discussion, the attendees voted on the recommended approaches. The result was to establish guidelines and/or policies relative to the adoption and implementation of codes based on three levels:

- **Level I;** focuses on meeting current code requirements as approved and enforced by the Jordan National Building Council (JNBC) for all building types for both public and private sectors. Code compliance is mandatory for design and construction of all buildings, enforced by the government and must be implemented by Jordan Engineer Association (JEA), Jordan Architect's Association (JAA), Jordan Contractor's Association (JCA), and Jordan Green Building Council (JGBC). This represents the minimum requirement of building standards in Jordan.
- **Level II;** focuses on green building guidelines that represent "Beyond Code" achievements. This level will address strategies for water and energy conservation which is crucial to Jordan's limited resources. Level II can be applied on mandatory basis for public buildings and/or voluntary basis for private sector buildings. Participation at this level can be based on building type and size that will be established by JNBC. Level II would incorporate a government-driven rating system, which would be linked to an incentive program promoted, managed, and enforced by the government. JEA, JAA, and JCA must implement this system in design and construction of buildings that will fall under this category that will be identified by JNBC. Level II will support and promote green building initiative in Jordan and can be used as a baseline for design and construction green buildings in Jordan.
- **Level III;** focuses on the pursuit of sustainable development, design and construction strategies that take a holistic approach to surpass water and energy conservation as required in Level II. This level will address water and energy more aggressively than in level II, and it will address the other most important elements in the build environment that are also crucial to Jordan including site selection, transportation, open green spaces, landscaping and irrigation, heat island effect, infrastructure, light pollution, renewable energy, recycling, material selection, indoor environmental quality, and day lighting and view. Level III provides the opportunity for a voluntary rating system adapted for the regional and climatic areas within Jordan from the USGBC LEED System. This level addresses a sustainable built environment beyond code and beyond governmental incentive programs. This rating system will be developed and managed by a JGBC that is led through the initiative of organizing members from both the private and public sectors interested in greening Jordan and ultimately by a not-for-profit organization with a

membership of architects, vendors, suppliers, retail, academic, schools, residential, contractors and other participants interested in sustainability in the built environment.

Discussion also centered on what actions are necessary to ensure the effective and efficient implementation of the agreed-upon approach. Key action items include the development of new code; an update of the current Jordanian building codes; identification of an effective methodology for code enforcement; development of the Level II green guidelines and rating system, development of a government-drive incentive program, development of the JGBC LEED regionalized rating system, and integration of green issues into the educational system,

This report includes a clear description of each recommendation, actions to be taken to implement the recommendations and suggested roles and responsibilities of each authority involved in ensuring implementation.

Appendix -1- in this report lay out the result of the recommendations from the workshop with proposed schedule completion and role of professional and governmental entities to accomplish each recommendation.

METHODOLOGY

The methodology utilized for the formation of this final report and its recommendations were based on the following:

1. Conducted a one-day workshop for the stakeholders to discuss the report's findings and recommendations.
2. The workshop was divided into two sessions. First, each finding was presented and discussed in detail identifying the weaknesses and the impact it is causing.
3. In the second workshop session, the recommendations were presented to the attendees outlining the advantages, disadvantages, the effect and impact of each recommendation.
4. Attendees were divided into individual groups to discuss and vote on each recommendation to reach a consensus of the preferred approach and its viability.
5. The first recommendation discussed was related to the approach recommended to implement the green building codes in Jordan where two paths were presented.
6. After agreeing on the best applicable approach, the remaining recommendations were presented and discussed in depth.
7. Group discussions took place on each of the proposed recommendations. At the conclusion of the group discussion, each participant voted on the preferred recommendation.
8. A list of the final recommendations, actions and implementation strategies were developed to present to the relevant authorities for implementation.

WORKSHOP RESULTS, ADOPTED RECOMMENDATIONS AND ACTIONS:

After individual group discussions and general discussion among the attendees, the following recommendation was agreed on based on majority voting:

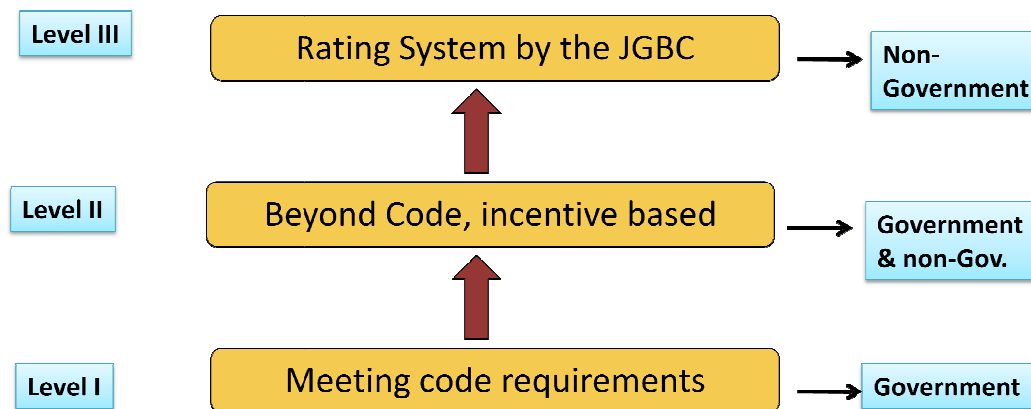
ESTABLISH GUIDELINES AND/OR POLICIES RELATED TO THE ADOPTION AND IMPLEMENTATION OF CODES BASED ON THREE LEVELS:

Level I: Meeting the code requirements and is applied on mandatory basis on all buildings by the JNBC. Building codes set the minimum requirements that buildings should comply with in order to ensure the safety and health of its occupants, they should be regularly reviewed in order to keep up with the most up to date technologies and designs, be Revamped and streamlined for consistency and most importantly be enforced effectively and efficiently.

Level II: Going “Beyond Code” Efforts which could be applied on mandatory or voluntary basis by the JNBC based on the type and size of building. This shall be implemented according to special green guidelines designed by the JNBC that set a rating system focusing on water and energy savings and that is linked with an incentive program provided by the government. This will assist Jordan to achieve its objectives of not only meeting building codes but to be able to achieve additional water and energy savings by adopting advanced water and energy conservation codes. This policy can mandate governmental

agencies and individuals to achieve a higher level of water, energy and cost savings, as well as lower environmental impact. A powerful strategy for reducing energy use in buildings is **combining energy codes with energy rating systems, similar to US Energy Star and green building rating systems**. The code establishes a bare minimum for energy efficiency while the rating system encourages innovation and provides incentives for better performance.

Level III: Going beyond the efforts of Level II, is a voluntarily system based on a Green Building Rating system that addresses sustainable build environment beyond Level II and is designed based on Jordan economic and environment priorities. This rating system shall be developed and implemented by JGBC that is led by an initiative of members from both the private sector and the public sector (any organization that is interested in greening Jordan).



Jordan's goal to reduce its water and energy consumption can be achieved if this approach is adopted and effectively implemented. As the authority regulating and monitoring the Jordanian build environment, the JNBC shall issue a policy describing this approach, implementation and clarifying the roles of each authority involved in the implementation.

It is very important that the JNBC and other related authorities and organizations work on developing the required systems through which the three levels are implemented in the way that will lead to the desired goals and objectives. According to each level, several actions shall be taken. Those are described below.

ACTIONS UNDER LEVEL I

The JNBC is responsible for developing, updating and enforcing building codes. It shall ensure that buildings in Jordan comply with the safety and health requirements as well as to demonstrate a reduction in fewer pollutants entering into the environment. To accomplish this task the JNBC shall work on the following issues:

1. Building Codes (JNBC)

- Revamp the building codes and streamline for consistency. Adopt a well known set of codes such as International Codes Council (ICC), ICC 2006 or

its most recent suite. Administrative provisions and amendments can be issued to ICC that is specific to Jordan including some of the existing Jordanian codes that have been developed to address water and energy specifics in Jordan. Such unified codes will be easier and more cost effective for designers, builders, inspectors and developers to provide affordable and safe residential and commercial building design. These unified streamlined codes can be used as baseline to measure the performance of buildings and compare it to green buildings.

- Adopt the new Unified Plumbing Code as developed by IDARA; Implementation of the proposed technical standards/regulations for water efficiency products issued by the Jordan Institution for Standards & Metrology (JISM) in 2009 will improve the water efficiency. This can be used as a baseline for water efficiency in green buildings. JNBC would be the appropriate authority to review and adopt.
- Adopt a new Unified Energy Code such as International Energy Conservation Code (IECC). Amend it to Jordan's most stringent energy requirement. Use it as an energy baseline for green buildings. JNBC would be the appropriate authority to review and adopt.
- Consider 18-24 months timeline for updating building codes, enacting and publishing; JNBC to oversee the process and schedule.
- Conduct a basic training program on the ICC codes adoption and implementation.
- JNBC is the sole developer and enforcer of the codes, JEA, JCA to implement.
- JGBC will have no role in the development of the code.

Expected benefits:

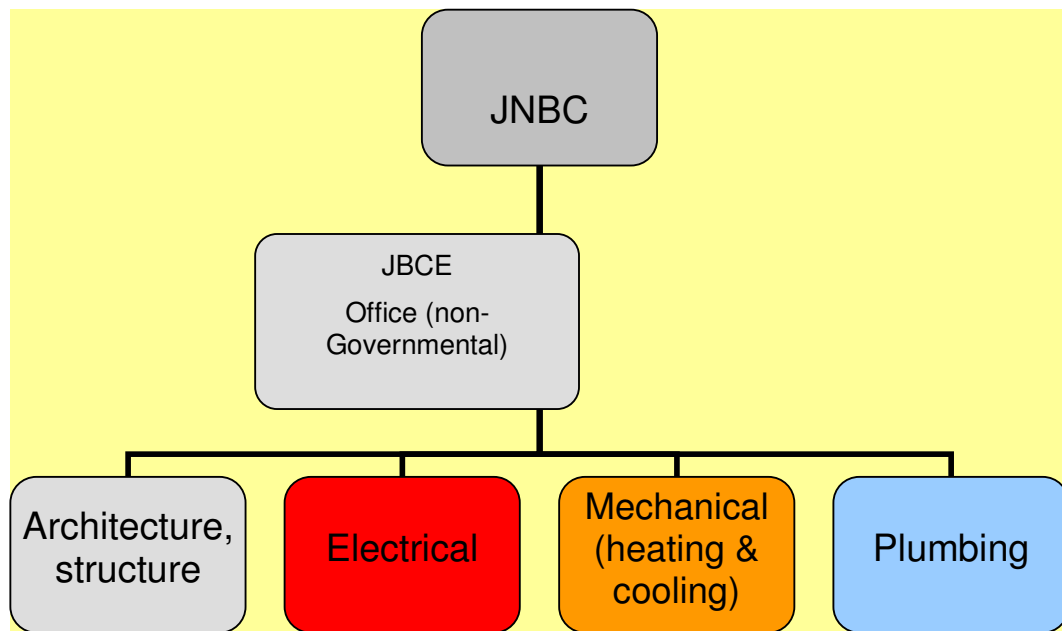
- Cost and schedule saving in updating and implementation revisions;
- Staying current with others in code updates
- Consistency in design and construction;
- Expedited code design process for design and construction; Reliance and confidence of investor in the construction industry in Jordan
- Water and energy saving with the proposed strategies in the recent Jordan unified plumbing and energy codes, which are similar to ICC.

2. Code Enforcement (JNBC)

- Establish a Code Enforcement Office. This new office can report to the MPWH through the JNBC, or it can be an independent non-governmental entity that is recognized and approved by the JNBC.

- This office should have the authority to answer all code related questions including requested code interpretation by designer and contractors and can make the final ruling.
 - This office should act as the third party design review and construction inspection. This will be acting as the quality control office for construction industry.
 - Within this office, establish a branch that addresses Occupational Safety & Health Administration (OSHA) addressing construction safety related issues.
 - This safety branch can develop or adopt OSHA safety standards with amendments to meet Jordan's construction industries' need and enforce the standards with guidelines for license and financial penalties for non conformance.
 - This office should ensure that the data and tools are available to the designers to design to code requirements such as daily updated weather data.
- Enforce the adopted codes and use it as baseline for green building rating system. This will support the implementation of the energy and water efficiency initiative in Jordan.
 - All design drawings will be reviewed by recognized entity/ies, construction will be inspected by the same team that reviewed the drawings for consistency, efficiency, and quality.
 - The JNBC will issue the policy and write legislation that will organize the business of codes enforcement, including entities that would be recognized and approved by the Enforcement Office to:
 - ✓ Review and verify design compliance with codes, according to current laws, this is the work of the JEA. The NBC can set the standards that will ensure the quality of the JEA's work.
 - ✓ Inspect buildings to verify that construction is in compliance with the designs and codes requirements. The NBC will issue the legislation to approve and recognize entities from the private sector as Building inspection bodies.
 - ✓ Inspect and review all green buildings that will be designed and build per JGBC rating system.
 - Develop standards of qualification for individuals who can take on this responsibility. The qualification can be related to the system that will be reviewed during design and inspected during construction. For example the main professionals that will be required for this office are mechanical, electrical, plumbing, civil/environmental, and structural engineers and registered architects.
 - Develop guidelines for the requirements for these professionals' continued education in the area of their specialty to keep their professional skill up to date based on the rapid changes in the construction industry.
 - Develop, publish and follow guidelines with clear procedures, timelines, and fees for review design and inspection of each project.
 - Provide training for the construction industry on safety and building green.

- Provide training and development for the new staff that will assume responsibility for this office.
- JNBC shall be the authorities to over see this office. It will approve the entities to perform these services.
- JNBC will select the entities based on set qualification and meeting the requirement to provide this service.
- All green buildings build to JGBC rating system will follow the set requirements by this office.



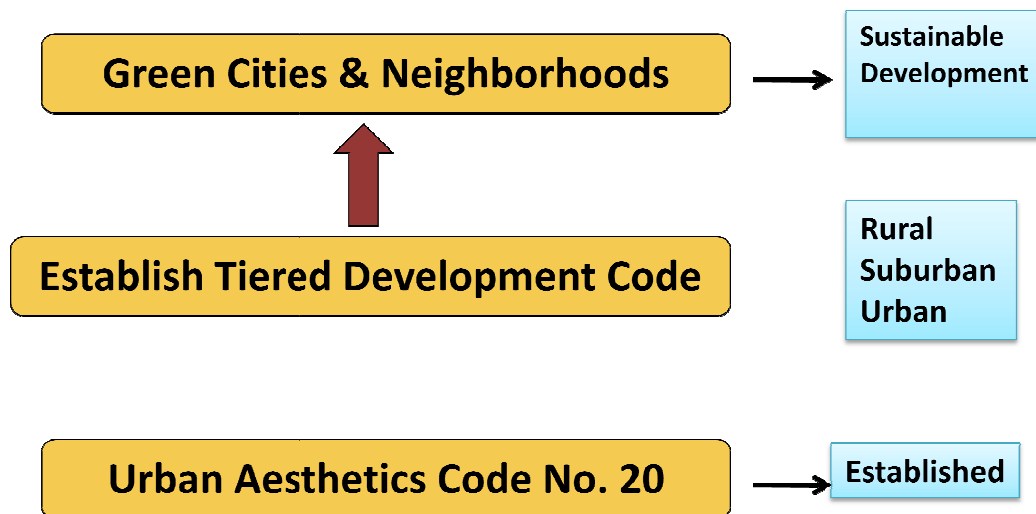
Expected Benefits:

- Contribute to economic development by creating jobs and the need for new skills
- Deliver quality buildings, especially the new high rise buildings that are becoming part of Jordan development fabric;
- Enforcement of the accountability of the designer and contractors;
- Positive impact on the industry from perception of new approach
- Attract investors
- Improve Efficiency and productivity of the designers, builders, reviewers and inspectors

3. Establish a Smart Growth Development Code:

Although Jordan has an existing code that is related to development, Urban Aesthetics Code, serial #20, which was updated in 2008. This code only addresses the urban setting. With the increasing growth of new development in Jordan, this code needs to be updated with an emphasis on sustainable development. The proposed Smart Growth Development Code should provide for the implementation of a comprehensive theme of a tiered system that reflects the different characteristics and priorities found throughout Jordan. A tiered development code that addresses rural, Suburban, Urban, Compact, and Downtown. This will address the sustainable development and infrastructure that was brought up by some stakeholders at the face-to-face meetings.

Sustainable planning and development is the key to sustainable design and construction. This code focuses on the big picture going beyond greening one building at a time. This will address greening neighborhoods and cities and their infrastructure that buildings are just small fraction of it.



Action and Implementation:

- Update Code #20 and integrate sustainable growth into it. Although, there are some guidelines available at the local level, but the sustainable development guidelines should be included as a base for local municipalities to follow and add/ integrate into local plans based on the region in the Jordan.
- Integrate into the local government guidelines for the municipalities as a smart growth development plan through the Ministry of Municipalities.
- Provide training on the planning and development of smart development codes and planning sustainable developments and cities. This training will be for code officials and the master planners for the municipalities around

Jordan. This training will provide planners with the tools for greening within the master planning process for Urban, Suburban, and Rural regions.

- Visit developed sustainable cities and neighborhood.

ACTIONS UNDER LEVEL II

This rating system can be linked with an incentive program provided by the government. Jordan strives not only to meet building energy codes but is interested in additional energy savings, can adopt advanced energy conservation codes. Policy can mandate governmental agencies and individuals to achieve a higher level of energy and cost savings, and lower environmental impact. A powerful strategy for reducing energy use in buildings is **combining energy codes with energy rating systems, similar to US Energy Star and green building rating systems such as LEED**. The code establishes a bare minimum for energy efficiency while the rating system encourages innovation and provides incentives for better performance.

1. Develop green building guidelines related to water and energy efficiency.

- Develop green building guidelines related to water and energy efficiency.

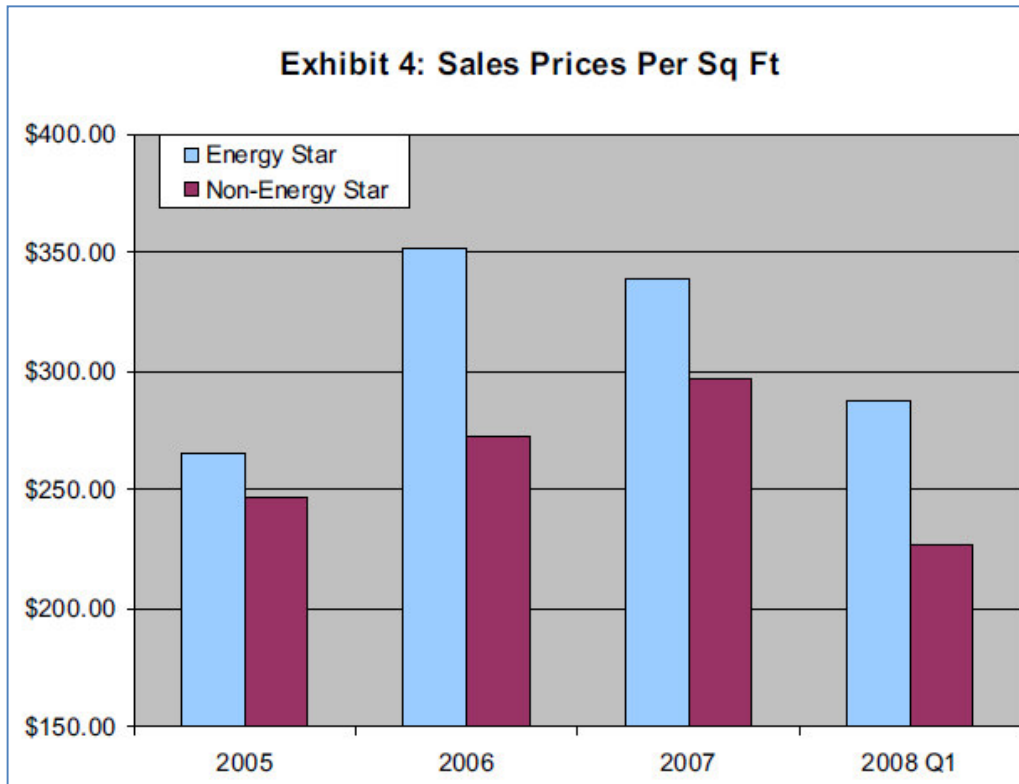
2. Develop green building guideline incentive program by government and non government in case of utilities companies.

- Adopt an incentive program linked with a rating system such as the US Energy Star Program. A Jordanian Energy Star Program can be established as a joint program of the Ministry of Energy, Ministry of Environment, and Ministry of Public Works and Housing. The proposed program can be mandatory for public sector and voluntary for private sector. The voluntary arm can be based on incentives to encourage support and enrollment. The program can award Energy Star Certification and become Energy Star International Partner with US Energy Star program. This program will assist Jordan to further conserve energy, water, save money, and protect the environment through energy and water efficiency products and practices. Also, the program will be a major environmental awareness vehicle for all population from young (in elementary school) to retiree.
- Partner with US Environmental Protection Agency (EPA) Energy Star Program to start this program. US EPA is partnered with dozen of countries all over the world.
- This program will also bring to Jordan economic prosperity by opening a new market for energy saving products for residential and commercial from offices and household appliances, equipments to building materials.
- Support the adoption of the new law that has been proposed and has been submitted for approval which will provide incentives for renewal energy such as P.V., solar and other systems.

- Engage utilities companies in incentive program in Jordan.
- Establish a certification award program as part of the incentive program.
- Become global partner with other countries who have established these type of programs to exchange and share knowledge and ideas.
- Develop standards of qualifications for individuals who can take on this responsibility. The qualification can be related to the system that will be reviewed during design and inspected during construction. For example, the main professionals that will be required for this office are mechanical, electrical, plumbing, civil/environmental, and structural engineers and registered architects.
- Develop guidelines for the requirements for these professionals' continued education in the area of their specialty to keep their professional skill up to date based on the rapid changes in the construction industry;
- Develop, publish and follow guidelines with clear procedures, timelines, and fees for review design and inspection of each project.

Expected benefits:

- Boom the economic development by introducing new products, material, appliances to the market;
- Energy saving in the residential and commercial that will contribute to awareness and education on energy and water saving ;
- Further reduce energy cost by taking advantage of the incentive and using efficient equipment and appliances;
- Further reduce Jordan CO2 foot print;
- Establish incentive program; rebates, permit fee and process;
- Encourage and even mandate utility providers to offer incentives that will contribute to environmental and economic benefits for Jordan;
- Encourage to utilize renewable energy avenues especially sun that is abundantly available in Jordan;



ACTIONS UNDER LEVEL III

1. Establish a Jordanian Green Building Council (JGBC).

Due to a grassroots effort within the public/private entities, increased public awareness and support of the green building movement, the formation of an official JGBC needs to take place prior to the end of 2009. A JGBC can harness the expertise, knowledge, enthusiasm and focus these energies into one cohesive strong organization. The JGBC will be the flagship of greening Jordan and the movement on energy, water, and environmental conservation in Jordan.

2. Develop a green building rating system

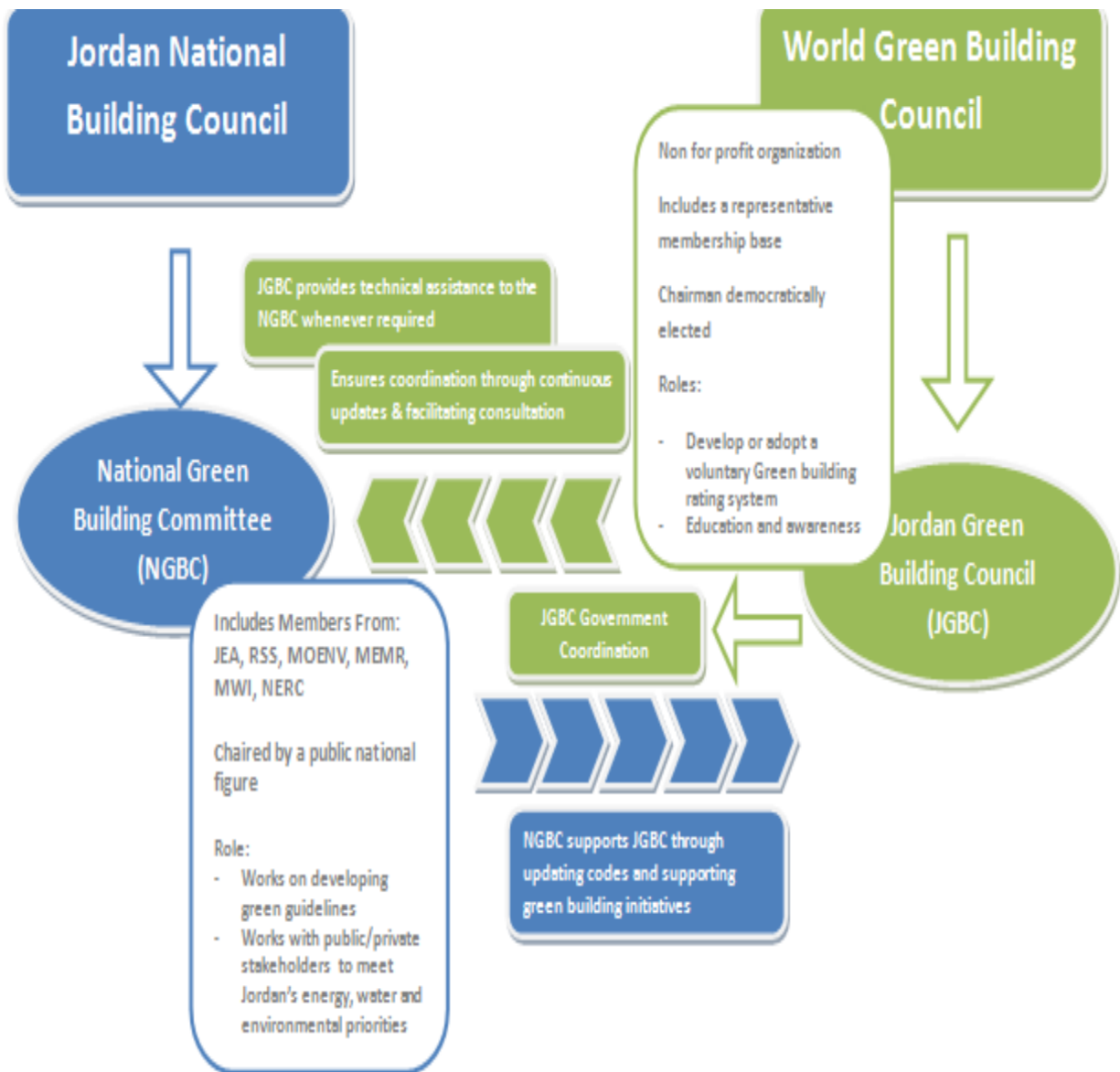
Upon formation of JGBC, a green building rating system will be needed to use as a tool that will transform the development, design, construction, and operation of the built environment in Jordan. At this time, Jordan can adopt an existing green building rating system such LEED with minor modification to fit Jordan (no need to reinvent the wheel). The new design and construction green model based on the green rating system will open Jordan to new business and professional possibility that will directly contribute to the country's economic development and new market development.

- **Encourage professionals to:**

- Train and obtain certification in building commissioning; A third party verification for design and construction inspections that is required for green buildings.
- Work with the governmental organization to further enhance the green building movement and rating system, see the flow chart below for roles and responsibilities.
- Provide an educational program to teach the public on green buildings.
- Support the green building movement expansion to cover every aspect of the build environment and sustainable development.

Expected benefits:

- Further support JNBC initiatives in saving water and energy
- Become hub of information and support in advancing green development, design and constitution
- Support awareness to spread knowledge and education about environmental, energy and water conservation issues



OTHER RECOMMENDATIONS

1. EDUCATION; INTEGRATE GREEN BUILDING ASPECTS AND PRACTICES INTO EDUCATION FROM K-12 TO UNIVERSITIES:

Integrating sustainability into the education system from K-12 to universities will have a positive impact on spreading the message about energy and water efficiency, green buildings, and the importance of environmental conservation. To do this we recommend that Jordan:

- Initiate and establish relationships with other educational institutions who have integrated sustainability into their daily practice. We recommend and encourage government representatives, decision makers, and stakeholders to visit other country's city governments, municipalities, schools and universities to witness the green movement in action.
- Recommend and encourage Jordanian cities, schools and universities to establish "sister cities, schools and universities" with cities, schools and universities in other parts of the world.
- Integrate Sustainability into educational system, build green schools and integrate construction program into the curriculum. Ministry of Education should incorporate programs for sustainable development and curriculum and share throughout the country's school system.
- Develop green guidelines targeted specifically for use by all schools, both public and private, that would be disseminated through the Ministry of Education.

2. OTHER IMPORTANT RECOMMENDATIONS DISCUSSED DURING THE WORKSHOP AND AGREED ON:

- Government representatives, decision makers, and stakeholders conduct site visits to other country's city governments, municipalities, schools and universities to witness green movement in action.
- Encourage and foster relationships in research and teaching in the area of water, energy, and environmental conservation between the educational institutions in Jordan and abroad to share knowledge and best practices.
- Enforcement of the Occupation Safety and Health Administration (OSHA) on construction projects or an approved equal regulation that provides safe construction sites for the construction worker and surrounding public and private areas.
- Implement the Amman Recycling Program.
- Monitor and Report CO2 emissions.
- Provide an on-line weather informational database. This is required to establish an energy baseline for energy modeling calculations for green buildings.

APPENDIX - 1-

ACTION PLAN

#	Recommendation	Indicator	Responsibility	Time frame for Start & Completion					Cooperation opportunities'
				Q4/09	Q1/10	Q2/10	Q3/10	Q4/10	
1.	<p><i>Establish guidelines or policy related to the adoption and implementation of codes based on three levels</i></p> <p>1.1 Develop Guidelines for Level II green buildings focusing on energy and water conservation</p> <p>1.2 Link the guidelines with an incentive scheme,</p>	<i>Policy or guideline is issued</i>	<i>National Building Council and the Ministry of Public Work and Housing</i>	<i>Start & complete</i>					<i>Jordan Green Building Council, RSS, AE Business Council.</i>
2	<p><i>Develop an incentive scheme</i></p> <p>2.1 Develop an incentive system, such as the U.S. EPA Energy Star Program.</p> <p>2.2 Engage utilities companies in incentive program in Jordan</p> <p>2.3 .Establish a certification award program for adopting the program</p> <p>2.4 Become global partner with other countries who have established these types of programs to exchange and share knowledge and ideas.</p>	<i>an incentive scheme developed, issued and approved</i>	<i>National Building Council and the Ministry of Public Work and Housing</i>	<i>Start</i>	<i>Complete</i>				<i>Ministry of environment, Ministry of energy , Ministry of water and irrigation, JEA, Jordan Architect Association, RSS, utility providers' representative, community leaders (this will make it for the people by the people), Jordan</i>

	2.5 Support the adoption of the new proposed law to provide incentives for renewal energy								Green Building Council, Jordan Contractor's Association , Universities
3	Establish a Smart Growth Development Code 3.1 Update code #20 and integrate sustainable growth into, 3.2 Integrated into the local government guidelines for the municipalities as a smart growth development plan through the Ministry of Municipalities. 3.3 Provide training on the planning and development of smart development codes and planning sustainable developments and cities. 3.4 Visit developed sustainable cities and Neighbourhoods around the world	code # 20 is updated with the new smart growth development guidelines, and integrated into local Municipalities' development requirements	National Building Council and the Ministry of Public Work and Housing, and local Municipalities	Start			Complete		Amman Municipality, other regions Local Municipalities, Jordan Green Building Council, Jordan Planners Association, RSS, JEA, Jordan Architect Association Universities
4	Revamp the building codes and streamline for consistency. 4.1 Adopt ICC codes for consistency. 4.2 Conduct a basic training on the ICC codes adoption and implementations..	Unified/streamlined set of codes adopted and published	National Building Council and the Ministry of Public Work and Housing,	Start			Complete		MOEnv, MOEnrg, MOFI, JGBC, RSS, JEA, JAA, JCA, and Universities

5	Code Enforcement <ul style="list-style-type: none"> 5.1 Establish a Code Enforcement Office, Non Governmental model 5.2 Enforce the adopted codes and use it as baseline for green building rating system during review process. 5.3 Develop standards of qualification for individuals who can take on this responsibility. 5.4 Develop guidelines the requirements for these professionals' continued education in the area of their specialty to keep their professional skill up to date based on the rapid changes in the construction industry. 5.5 Establish a safety division within this office, OSHA equivalent. The construction industry in Jordan in great need for safety enforcement during construction. 5.6 .Develop, publish and follow guidelines with clear procedures, timelines, and fees for review design and inspection of each project. 5.7 Provide training to the construction industry on safety and building green. 5.8 Provide training and development for the new staff that will assume this 	A code enforcement office based on third party review & inspection office with staff for structural, mechanical, electrical, plumbing & civil review and inspection construction projects is established and recognized	National Building Council, the Ministry of Public Work and Housing, and Ministry of Health	Start				Complete		Ministry of environment, Ministry of energy , Ministry of water and irrigation, RSS, JEA, Jordan Architect Association, Jordan Contractors' Association, and Universities
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	<i>responsibility of this office.</i>								
6	<p><i>Jordanian Green Building Council</i></p> <p>6.1 Establish Jordan Green Building Council to be non for profit organization.</p> <p>6.2 Work with the governmental organization to further enhance the green building movement and rating system, see below flow chart for roles and responsibilities.</p> <p>6.3 Develop green building rating system for Jordan, a voluntary rating system.</p> <p>6.4 Provide educational program to educate public on green buildings.</p> <p>6.5 Support the green building movement expansion to cover every aspect of the build environment and sustainable development.</p>	<p><i>Jordanian Green Building Council and a green building rating system with emphasis on the environmental challenges specific to Jordan and the region is established and adopted</i></p>	<p><i>Jordan Green Building Council and its volunteers</i></p>	<p>Start</p>		<p>Complete</p>			<p><i>National Building Council, the Ministry of Public Work and Housing, and Ministry of Health. Ministry of environment, Ministry of energy , Ministry of water and irrigation, Jordan Green Building Council, RSS, JEA, Jordan Architect Association, Jordan Contractors' Association, and Universities</i></p>

7	<p><i>Education; Integrate green building aspects and practices into education from K-12 to Universities</i></p> <p>7.1. Integrate Sustainability into Education, build green schools and integrate into the curriculum</p> <p>7.2. Ministry of education to Share programs among school for sustainable development and curriculum</p> <p>7.3. Develop a green guideline just for schools where Ministry of education distributes to all schools in the country</p>	<p><i>Schools green guideline is established.</i></p> <p><i>Green schools are built</i></p> <p><i>Sustainability issues are integrated into curriculum</i></p>	<p><i>Ministry of Education, Ministry of Health, School board/Administrators</i></p>						<p><i>National Building Council, the Ministry of Public Work and Housing, School staff, Universities, Jordan Green Building Council, JEA, Jordan Architects' Association, Jordan Contractors' Association</i></p>
				Start			Complete		

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