Log # _____
(office use only)

PLEASE FOLLOW INSTRUCTIONS ON PAGE FIVE

1. State Building Code to be Amended:

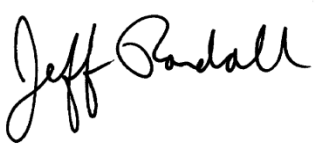
[ ] International Building Code
[ ] International Residential Code
[ ] ICC ANSI A117.1 Accessibility Code
[x] International Fire Code
[ ] Uniform Plumbing Code
[ ] State Energy Code
[ ] International Mechanical Code
[ ] International Fuel Gas Code
[ ] NFPA 54 National Fuel Gas Code
[ ] NFPA 58 Liquefied Petroleum Gas Code

Section _605.11 & 105.7.13_____ **Page** __ The pages in question are p. 11 for 105.7.13, and p. 77 – 78 for Section 605.11._____

2. Applicant Name (Specific local government, organization or individual):

__Power Trip Energy, Corp._____

3. Signed:



_____ __Solar Agent_____ _3-1-12_____
Proponent **Title** **Date**

4. Designated Contact Person:

_Jeff Randall _____ _Solar Agent_____
Name **Title**

Address: __83 Denny Ave, Port Townsend, WA 98368_____

_____

Office Phone: (360)_643-3080_____**Cell:**(360) 301-9019_____Fax: (360)_539-1857_____

E-Mail address: _jeffr@powertripenergy.com_____

5. Proposed Code Amendment. Use 'legislative format' including both old and new language. **See instructions on page five for specific details.** Please use a separate sheet for each separate proposal.

Code __IFC _ **Section** __ 605.11 & 105.7.13_____ **Page** _ The pages in question are p. 11 for 105.7.13, and p. 77 – 78 for Section 605.11._____

Amend section to read as follows:

Sec. 1. IFC 105.7.13 Solar photovoltaic power systems, is amended as follows (underlined language added, strikeout language deleted):

105.7.13 Solar photovoltaic power systems.

A construction permit is required to install or modify solar photovoltaic power systems.

Exceptions: Residential solar photovoltaic power systems located on one- and two-family dwellings shall be exempt from the construction permit requirement but must comply with the standards contained in IFC sections 605.11.1 Marking and 605.11.2 Locations of DC conductors.

Sec. 2. IFC 605.11 Solar Photovoltaic Power Systems (sections 605.11 – 605.11.4), is amended as follows (underlined language added, strikeout language deleted):

605.11 Solar photovoltaic power systems.

Solar photovoltaic power systems shall be installed in accordance with Sections 605.11.1 through 605.11.3.2.3 ~~605.11.4~~, the *International Building Code* and NFPA 70.

Exception: Detached, nonhabitable Group U structures including, but not limited to, parking shade structures, carports, solar trellises, accessory structures to a residence (such as a detached shop, barn, or garage) and similar structures shall not be subject to the requirements of this section.

605.11.1 Marking.

Marking is required on interior and exterior direct-current (DC) conduit, enclosures, raceways, cable assemblies, junction boxes, combiner boxes and disconnects.

605.11.1.1 Materials.

The materials used for marking shall be reflective, weather resistant and suitable for the environment. Marking as required in Sections 605.11.1.2 through 605.11.1.4 shall have all letters capitalized with a minimum height of $^{3}/_{8}$ inch (9.5 mm) white on red background.

605.11.1.2 Marking content.

The marking shall contain the words "WARNING: PHOTOVOLTAIC POWER SOURCE."

605.11.1.3 Main service disconnect.

The marking shall be placed adjacent to the main service disconnect in a location clearly visible from the location where the disconnect is operated.

605.11.1.4 Location of marking.

Marking shall be placed on interior and exterior DC conduit, raceways, enclosures and cable assemblies every 10 feet (3048 mm), within 1 foot (305 mm) of turns or bends and within 1 foot (305 mm) above and below penetrations of roof/ceiling assemblies, walls or barriers.

605.11.2 Locations of DC conductors.

Conduit, wiring systems, and raceways for photovoltaic circuits shall be located as close as possible to the ridge or hip or valley and from the hip or valley as directly as possible to an outside wall to reduce trip

hazards and maximize ventilation opportunities. Conduit runs between sub arrays and to DC combiner boxes shall be installed in a manner that minimizes the total amount of conduit on the roof by taking the shortest path from the array to the DC combiner box. The DC combiner boxes shall be located such that conduit runs are minimized in the pathways between arrays. DC wiring shall be installed in metallic conduit or raceways when located within enclosed spaces in a building. Conduit shall run along the bottom of load bearing members.

605.11.3 Access and pathways for commercial buildings and residential housing comprised of three or more units. Roof access, pathways, and spacing requirements shall be provided in accordance with Sections 605.11.3.1 through 605.11.3.2.3 ~~605.11.3.3.3.~~

Exceptions:

1. One- and two-family residential dwellings are exempt from the access and pathway requirements.

~~1~~ 2. ~~Residential s~~Structures shall be designed so that each photovoltaic array is no greater than 150 feet (45 720 mm) by 150 feet (45 720 mm) in either axis.

~~2~~. 3. Panels/modules shall be permitted to be located up to the roof ridge where an alternative ventilation method approved by the fire chief has been provided or where the fire chief has determined vertical ventilation techniques will not be employed.

605.11.3.1 Roof access points for commercial buildings and residential housing comprised of three or more units.

Roof access points shall be located in areas that do not require the placement of ground ladders over openings such as windows or doors, and located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires, or signs.

~~**605.11.3.2 Residential systems for one- and two-family dwellings.**~~

~~Access to residential systems for one- and two-family dwellings shall be provided in accordance with Sections 605.11.3.2.1 through 605.11.3.2.4.~~

~~**605.11.3.2.1 Residential buildings with hip roof layouts.**~~

~~Panels/modules installed on residential buildings with hip roof layouts shall be located in a manner that provides a 3-foot-wide (914 mm) clear access pathway from the eave to the ridge on each roof slope where panels/modules are located. The access pathway shall be located at a structurally strong location on the building capable of supporting the live load of fire fighters accessing the roof.~~

~~**Exception:** These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.~~

~~**605.11.3.2.2 Residential buildings with a single ridge.**~~

~~Panels/modules installed on residential buildings with a single ridge shall be located in a manner that provides two, 3-foot-wide (914 mm) access pathways from the eave to the ridge on each roof slope where panels/modules are located.~~

~~**Exception:** This requirement shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.~~

~~**605.11.3.2.3 Residential buildings with roof hips and valleys.**~~

~~Panels/modules installed on residential buildings with roof hips and valleys shall be located no closer than 18 inches (457 mm) to a hip or a valley where panels/modules are to be placed on both sides of a hip or valley. Where panels are to be located on only one side of a hip or valley that is of equal length, the panels shall be permitted to be placed directly adjacent to the hip or valley.~~

~~**Exception:** These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.~~

~~**605.11.3.2.4 Residential building smoke ventilation.**~~

~~Panels/modules installed on residential buildings shall be located no higher than 3 feet (914 mm) below the ridge in order to allow for fire department smoke ventilation operations.~~

605.11.3.2 ~~605.11.3.3 Other than residential buildings~~ Commercial buildings and residential housing comprised of three or more units.

Access to systems for occupancies other than one- and two-family dwellings shall be provided in accordance with Sections 605.11.3.3.1 through 605.11.3.3.3.

Exception: Where it is determined by the *fire code official* that the roof configuration is similar to that of a one- or two-family dwelling, reduced access and ventilation provisions may be permitted to be used ~~the residential access and ventilation requirements in Sections 605.11.3.2.1 through 605.11.3.2.4 shall be permitted to be used~~.

605.11.3.2.1 ~~605.11.3.3.1~~ Access for commercial buildings and residential housing comprised of three or more units.

There shall be a minimum 6-foot-wide (1829 mm) clear perimeter around the edges of the roof.

Exception: Where either axis of the building is 250 feet (76 200 mm) or less, there shall be a minimum 4-foot-wide (1290 mm) clear perimeter around the edges of the roof.

605.11.3.2.2 ~~605.11.3.3.2~~ Pathways for commercial buildings and residential housing comprised of three or more units.

The solar installation shall be designed to provide designated pathways. The pathways shall meet the following requirements:

1. The pathway shall be over areas capable of supporting the live load of fire fighters accessing the roof.
2. The centerline axis pathways shall be provided in both axes of the roof. Centerline axis pathways shall run where the roof structure is capable of supporting the live load of fire fighters accessing the roof.
3. Shall be a straight line not less than 4 feet (1290 mm) clear to skylights or ventilation hatches.
4. Shall be a straight line not less than 4 feet (1290 mm) clear to roof standpipes.
5. Shall provide not less than 4 feet (1290 mm) clear around roof access hatch with at least one not less than 4 feet (1290 mm) clear pathway to parapet or roof edge.

605.11.3.2.3 ~~605.11.3.3.3~~ Smoke ventilation for commercial buildings and residential housing comprised of three or more units.

The solar installation shall be designed to meet the following requirements:

1. Arrays shall be no greater than 150 feet (45 720 mm) by 150 feet (45 720 mm) in distance in either axis in order to create opportunities for fire department smoke ventilation operations.
2. Smoke ventilation options between array sections shall be one of the following:

2.1. A pathway 8 feet (2438 mm) or greater in width.

2.2. A 4-foot (1290 mm) or greater in width pathway and bordering roof skylights or smoke and heat vents.

2.3. A 4-foot (1290 mm) or greater in width pathway and bordering 4-foot by 8-foot (1290 mm by 2438 mm) "venting cutouts" every 20 feet (6096 mm) on alternating sides of the pathway.

~~**605.11.4 Ground-mounted photovoltaic arrays.**~~

~~Ground-mounted photovoltaic arrays shall comply with Sections 605.11 through 605.11.2 and this section. Setback requirements shall not apply to ground-mounted, free-standing photovoltaic arrays. A clear, brush-free area of 10 feet (3048 mm) shall be required for ground-mounted photovoltaic arrays.~~

Are additional pages attached? **Yes** No

Please note number of additional pages:

Attachments include:

1. **Attachment II – Part II - Intended Purpose of Amendment – P 8**
2. **Attachment III – Part IV – Amendment Costs and Benefits Table – P 14**
3. **Attachment IV – Cost Benefit Case Studies – P 15**

Supporting Data for Statewide Amendment Proposals. This information is required for all statewide amendment proposals. **Attach supporting documentation, as necessary; incomplete proposals will not be accepted.**

The SBCC requires supporting data on any amendment proposal to show:

1. **That it meets basic criteria – See Part I to specify how this proposal meets the criteria for code amendment.**
2. **The intended effect—See Part II to describe the purpose of the proposed amendment, including the benefits and the problems addressed.**
3. **The potential impacts or benefits to business—See Part III/Types of Construction, to explain how methods in construction businesses, industries and services would be affected.**
4. **The potential impact on enforcement procedures, See Part III/Types of Services Required, to provide some analysis of the impacts on code enforcement in local jurisdictions.**
5. **Economic costs and benefits – Use the Table in Part IV of this form to estimate the costs and benefits of the proposal on construction practices, users and/or the public, the enforcement community, and operation and maintenance.**

Part I ❖ Background information on amendment.

Code References: **IFC Sections 605.11 & 105.7.13** Title: **Solar Photovolataic Power Systems**
Related codes:__**National Electric Code**_____ (Does this amendment change other related codes?) **- No.**

Proponent: **Power Trip Energy, Corp** _____Phone: **360-643-3080** _____ Date: **3-1-12**_____

NOTE: State-wide and emergency state-wide amendments to the state building code must be based on one of the following criteria; please indicate the pertinent rationale for the proposed amendment by selecting from the list below:

(1) The amendment is needed to address a critical life/safety need.
(2) The amendment is needed to address a specific state policy or statute.
(3) The amendment is needed for consistency with state or federal regulations.
(4) The amendment is needed to address a unique character of the state.
(5) The amendment corrects errors and omissions.

Part II ❖ Amendment Benefit:

PROBLEM(S) ADDRESSED (Describe the intended effect of the proposed code amendment): _____ _____
See Attachment II - Part II - Intended Purpose of Amendment

PRIMARY REASON FOR AMENDMENT: (Describe how the amendment meets one of the criteria listed above) _____
See Attachment II - Part II - Intended Purpose of Amendment

TYPE OF BENEFITS PROJECTED: _**See Attachment II - Part II - Intended Purpose of Amendment**

Part III ❖ Amendment Impacts or Benefits:

TYPES OF CONSTRUCTION: **X**☐ New Construction **X**☐ Alteration/Tenant Improvement/Repair
X☐ Residential-Single Family ☐ Residential-Multi Family ☐ Commercial ☐ Industrial

List businesses/industries affected by amendment:

Manufacturers: **Solar PV manufacturers (in Washington Silicon Energy and Itek Energy)**
Specific Construction Contractors & Trades: **Electrical contractors installing solar PV systems**. _____
Construction Supply Industry: _____
Specialty Trades: **Solar PV installation contractors.** _____
Types of Buildings: _____
Fire Protection Industry: _____

TYPES OF SERVICES REQUIRED:

☐ **Reporting.** Brief Description_____**n/a**_____

X☐ **Record Keeping.** Brief Description: **2012 IFC solar provisions would impact permitting functions of local jurisdictions. Amendment seeks to simplify and improve these permitting processes for solar PV installations. See Attachment II for more information.**

X☐ **Other.** Brief Description__**Amendment is intended to avoid negative impacts to solar PV industry and state interest of maintaining access to direct sunlight for residential homeowners desiring to install solar PV systems on their homes. The 2012 IFC would significantly impact these state interests. See attachments II, III, and IV for additional information.**

☐ **Indirect Cost to Industry**. Indicate whether there are multiple sources to obtain the equipment, material or service required by this proposal. If not, provide a justification of the benefit versus small business impact. **– N/A**

Part IV ❖ Amendment Costs and Benefits – See Attachments II, III & IV for additional information.

	Construction[1]			Enforcement[2]			Operations & Maintenance[3]		
Building Type	Costs	% impact[4]	Benefits[5]	Costs	% impact	Benefits	Costs	% impact	Benefits
Residential		**See Attachment III & IV**	**See Attachment III & IV**			**See Attachment II for benefits to local government.**			
Single family		**See Attachment III & IV**	**See Attachment III & IV**			**Same as above.**			
Multi-family			**See attachment III**			**Same as above.**			
Commercial/Retail			**See attachment III**			**Same as above.**			
Industrial			**See attachment III**			**Same as above.**			
Institutional			**See attachment III**			**See Attachment II**			

[1] $ / square foot of floor area or other cost. Attach data. **Construction** costs are costs prior to occupancy, and include both design and direct construction costs that impact the total cost of the construction to the owner/consumer.

[2] Cost per project plan. Attach data. **Enforcement** costs include governmental review of plans, field inspection, and mediated litigation required for enforcement.

[3] Cost to building owner/tenants over the life of the project.

[4] Cost differential over a specific size project or range of projects as determined by the proponent. Provide sufficient cost and benefit detail to clarify the impact to the Council. All data should be created and referenced to third party reputable sources for verification.

[5] Note sectors with measurable benefit from Part II, including benefits to a) the user, b) the public, c) the industry, and/or d) the economy; use e) for all of the above.

Attachment II – Part II - Intended Purpose of Amendment
Part II ❖ Amendment Benefit:

A. PROBLEM(S) ADDRESSED (Describe the intended effect of the proposed code amendment):

The 2012 International Fire Code (IFC) includes new sections (605.11 & 105.7.13) that establish new requirements (including roof setbacks) for solar photovoltaic (PV) systems and an additional permitting process. These new IFC code sections were originally developed in southern California and many of the assumptions of the code are not valid in Washington State. The 2012 IFC as written will have sweeping negative impacts upon the Washington state solar industry and will be burdensome and complicated to administer by local jurisdictions. The proposed amendment seeks to identify these issues and problems. The best solution would be to implement those portions of section 605.11 which are not controversial (sections 605.11.1 -605.11.2 DC conductors marking and location) and further study the remaining provisions prior to statewide adoption. The proposed amendment by exempting one and two family homes from the permitting and access and ventilation setback provisions, offers one solution to a complicated set of issues. Other alternatives may prove to serve both the interests of the fire protection industry, local jurisdictions, the solar PV industry, and homeowners and businesses interested in solar power.

IFC based upon California guidelines

The 2012 IFC solar provisions are intended to provide firefighters access and ventilation space on all roofs of habitable buildings when those roofs also contain solar PV equipment. The 2012 IFC provisions originate from standards developed by large municipal fire departments in southern California where it is common to aggressively access a roof to ventilate during a fire. However, in Washington state many fire departments (half or more) do not utilize roof top fire fighting techniques. The reasons why many fire departments do not use these techniques is that it is very risky to put firefighters on a roof during a fire, especially on a lightly built residential truss roof. These fire departments use alternative methods to fight these fires. The roof setbacks included in the IFC would not be used by many fire departments in Washington State.

Solar typically only on 1 roof plane

Over 90% of the solar installations in Washington State are located on residential roofs. Most of these installations occur on sloping roofs. When locating a solar array it is important to use the roof surfaces with the sunniest exposure. If a sunny south roof is available, that roof will be used for a solar array. If the house has east and west solar exposure, typically the roof with the least shading is selected for a solar array. If the south roof has solar modules, the north side of the peak and north roof are typically available for firefighter access if needed.

As currently written the 2012 IFC would require one or more accesses from the gutter of each sloping roof to the peak plus a 3 foot ventilation area from the peak to the top of the solar array. An analysis conducted of 25 recent solar PV installations conducted by Power Trip Energy concluded that 64% of these projects would required the solar array reconfigured at increased cost and/or reduced power to accommodate these setbacks. On all but one of these buildings, the other side of the peak was completely open and accessible to the fire department. It would appear that the setbacks are unnecessary for two reasons: a) many fire departments (including the East Jefferson Fire Department serving the Port Townsend area) would not access a roof during a fire, and b) if the fire department needed access the roof on the other side of the peak was available. This issue should be further analyzed before the 2012 IFC is implemented on a state-wide level.

It is important to realize that seeing solar modules on a rooftop in Washington State is a pretty rare thing. There are currently 2,289 grid-tied solar PV systems certified in the state. This year we are trying to get to the point where 1% of the homes in Jefferson County have solar PV arrays (150, we are currently at about 120). We are a long way from having roof-top solar being a common sight on in Washington. We have time to establish more balanced standards than those currently contained in the 2012 IFC.

Flat roofs less of an issue in Washington than California

When a solar array is mounted on a flat roof, the modules are tilted or "racked-up" to face south at an angle. When this is done an aisle several feet wide is created between each row of modules to avoid the row in front from shading the row in back. For this reason, on a flat roof in Washington with a solar PV array, there will always be significant roof space for access and ventilation for firefighters.

In California, it is common to see large solar installations on flat warehouse and commercial building roofs. Because of California's more southern latitude, it is common for solar modules on these installations to be placed flat with no spacing between the modules. This helps explain why the 2012 IFC based upon the California guidelines puts so much emphasis upon maximum solar array size (no more than 150' x 150') with required aisles between the arrays. There are many installations of this type in California. In Washington, large installations on commercial buildings are not common due to the different pricing and solar rebate structures in our state. And when solar installations are placed on flat roofs, they are never placed flat, they are always tilted up with aisles for access in between. This background information is provided to help explain why the 2012 IFC provisions are drafted the way they are. Why these provisions have been lifted from a set of California guidelines without modification, and suggested for nationwide adoption, is a bit baffling.

The amendment does not propose to alter the 2012 IFC provisions regarding multi-family and commercial structures. It was because of time, data and necessity that I did not address these provisions. We don't really know how the 2012 IFC might impact multifamily and commercial solar PV installations in our state. We should find out before we adopt these standards as currently written.

3 foot ventilation space and ice dams

The 2012 IFC requires that solar PV arrays on sloping roofs include a "ventilation space" measuring 3 feet from the top of each peak. The solar array must be mounted below this ventilation space unless waived by the authority having jurisdiction. Normally a solar PV array is mounted even with the peak in Washington State. Snow accumulation melts and slides off rather quickly on the first couple sunny days, in fact much more quickly than on the adjacent roof surface. If solar arrays were required to be mounted 3 feet from the roof peak, the snow above the array would be shaded and impeded from melting by the PV array. This snow could partially melt and freeze forming an ice dam above the solar array. Ice dams can cause roof leaks by preventing melting snow or rain from flowing normally down the roof.

In southern California, this issue of snow was probably not given a second thought. But in many parts of Washington we experience significant snow fall, for extended periods. The potential for the 3 foot ventilation setback to cause ice damming and roof damage (especially in Eastern Washington) should be carefully evaluated before this provision is implemented.

Ground mounted solar arrays and 10 foot vegetative setback

The IFC also contains a requirement that all ground mounted solar PV installations maintain a 10 foot vegetative setback (605.11.4). It is not clear why this language is included in the 2012 IFC other than it also originates from the California standards. To function properly, it is important that a ground mounded solar array not have any vegetation over 2 feet in height within an arc of 180 degrees on the south side of the array. So if firefighter access is the point of the vegetative setback, the south east and west sides of a ground mounted array are always accessible. It is unclear why the IFC requires a 10 foot vegetative setback on the north side of a ground mounted array. No minimum height of vegetation is mentioned in the IFC.

Homeowners, and some municipalities, on the other hand will often desire to screen the north side of a solar array from view with small bushes or small trees. The back side of a solar array is not that interesting to look at. This is another issue that should be further studied before the 2012 IFC is implemented. The proposed amendment would eliminate the vegetative setback requirement.

2012 IFC provisions overly complicated and potentially burdensome to local jurisdictions

The 2012 IFC provisions set up a new fire code construction permit for solar PV installations. The provisions of section 605.11 provide a variety of access and pathway setbacks for different types of roofs. However, residential sloped roofs often do not fall into the neat "single peak" or "hip and valley" categories provided in the 2012 IFC. There will be significant administrative burden in working with applicants on determining how the IFC provisions would apply to each circumstance. Also, allows the IFC gives the authority having jurisdiction the power to waive the 3 foot ventilation setback in certain circumstances. Local jurisdictions should anticipate many requests for "waivers" from this ventilation requirement as the top 3 feet of the roof is typically the sunniest part of the roof (least likely to be shaded). One fire official when asked how these provisions would be administered responded that the building department would take care of the application process. Building department staff will be hard pressed to exercise the kind of judgment required by the current IFC provisions and will be calling their fire department staff for assistance. Fire departments should be ready to devote additional resources for this permit review. Much confusion and delay could be avoided if we take the time now to improve these standards.

How proposed amendment addresses these issues

This amendment seeks to reduce the impact of the 2012 IFC provisions upon the Washington solar PV industry and to residential homeowners by exempting single family residences from the access and ventilation requirements. This approach maintains the status quo for residential installations which constitute 90% of the projects currently occurring in our state. The amendment takes the position that adjacent roofs are typically available for fire fighter access in the unlikely event that firefighters would ever need to access the roof.

If this amendment were adopted by Washington State, those local jurisdictions that wish to adopt a more restrictive approach (requiring specific roof access on residences) could do so by adopting a more restrictive standard at the local level. These standards could take a variety of forms less restrictive than the 2012 IFC. Leaving adoption of more restrictive standards to local jurisdictions would reduce the impact upon the solar PV industry and provide homeowners and other members of the public a better chance to be aware of and participate in the process.

The amendment seeks to mitigate some of the negative impacts of sections 605.11 & 105.7.13 of the 2012 IFC. Another and perhaps better alternative would be to table the implementation of these sections to allow for further study to determine the actual needs of Washington fire departments and to better understand the impacts to solar PV installations. This evaluation should address the inconsistencies of the California roots of the 2012 IFC solar provisions with the circumstances in Washington State. Taking the time to do this work now will help keep the solar industry in our state growing in an economic time when our state needs us. Doing the work now also would avoid unnecessarily burdening local jurisdictions with difficult to administer regulations at a time when they are strapped for resources.

Review of the IFC should also evaluate whether the solar provisions would be more appropriately incorporated into the NEC (National Electrical Code) which contains Article 690 regulating the installation of solar PV systems. With just 2,289 solar PV installations currently in the state of Washington, there is no imminent threat that requires immediate action. We have the time to do the right thing.

B. PRIMARY REASON FOR AMENDMENT: (Describe how the amendment meets one of the criteria listed below):

NOTE: State-wide and emergency state-wide amendments to the state building code must be based on one of the following criteria; please indicate the pertinent rationale for the proposed amendment by selecting from the list below:

(1) The amendment is needed to address a critical life/safety need.
(2) The amendment is needed to address a specific state policy or statute.
(3) The amendment is needed for consistency with state or federal regulations.
(4) The amendment is needed to address a unique character of the state.
(5) The amendment corrects errors and omissions.

(2) The amendment is needed to address a specific state policy or statute.
Renewable Energy is a key part of State energy goals. The state offers incentives for the manufacture and development of renewables. State law requires utilities to acquire renewable resources. The State Energy Strategy and economic development strategies encourage renewable energy development. The 2012 IFC would unnecessarily hinder the implementation of these goals by reducing the available roof space that could otherwise be used for solar PV installations. The 2012 IFC solar provisions are also complicated, not well designed for our state's conditions, and will burden local jurisdictions charged with their administration. Washington State is one of 22 Solar Rooftop Challenge participants in the nation seeking ways to improve the permitting process for solar PV installations.

Renewable Portfolio Standard – I-937 – requires new renewables
Washington was the second state in the nation to pass a renewable energy standard by ballot initiative. The Energy Independence Act, commonly known as I-937, calls for state electric utilities serving more than 25,000 customers to obtain 15% of their electricity from new renewable resources by 2020 and to undertake all cost-effective energy conservation. Small solar PV systems located on utility customer's property (or roof tops) are given double credit in meeting the Renewable Portfolio Standard. The 2012 IFC provisions will hamper our ability to use rooftops to help meet these goals.

Production and tax incentives – encourages renewable deployment through incentives
The Washington legislature has adopted production incentives and tax incentives to encourage the manufacture and installation of renewable energy. These tax incentives include reduced B&O taxes for in-state manufacturing of solar equipment, sales tax exemptions for those who purchase solar PV systems prior to June 30, 2013, and an annual cost recovery incentive program for grid-tied solar PV systems (through June 30, 2020). Encouraging the installation of customer owned solar PV systems is part of a coordinated state strategy to stimulate investment in the local economy and in renewable energy.

Washington State also requires major utilities to offer Green Power programs and to file annual reports.

2012 Washington State Energy Strategy
The new 2012 Washington State Energy Strategy-http://www.commerce.wa.gov/site/1327/default.aspx was released earlier this year. The legislation guiding the development of the strategy emphasized that the energy strategy should be clean, competitive and build Washington State's innovation economy.

The legislation declares that a successful Energy Strategy will balance three goals in order to:

1. Maintain competitive energy prices that are fair and reasonable for consumers and businesses and support Washington's continued economic success;

2. Increase competitiveness by fostering a clean energy economy and jobs through business and workforce development; and

3. Meet the state's obligations to reduce greenhouse gas emissions. This goal refers to a 2008 state law that established the goal of reducing statewide greenhouse gas emissions to 1990 levels by 2020, to 25 percent below 1990 levels by 2035, and to 50 percent below by 2050.

These three goals have served as the primary guidelines for work done on the 2012 Energy Strategy the past 18 months.

In addition to the three goals, the legislation provides nine guiding principles:

1. Pursue all cost-effective energy efficiency and conservation as the state's preferred energy resource, consistent with state law;

2. Ensure that the state's energy system meets the health, welfare, and economic needs of its citizens with particular emphasis on meeting the needs of low-income and vulnerable populations;

3. Maintain and enhance economic competitiveness by ensuring an affordable and reliable supply of energy resources and by supporting clean energy technology innovation, access to clean energy markets worldwide, and clean energy business and workforce development;

4. Reduce dependence on fossil fuel energy sources through improved efficiency and development of cleaner energy sources, such as bioenergy, low carbon energy sources and natural gas, and leveraging the indigenous resources of the state for the production of clean energy;

5. Improve efficiency of transportation energy use through advances in vehicle technology, increased system efficiencies, development of electricity, biofuels and other clean fuels, and regional transportation planning to improve transportation choices;

6. Meet the state's statutory greenhouse gas limits and environmental requirements as the state develops and uses energy resources;

7. Build on the advantage provided by the state's clean, regional electrical grid by expanding and integrating additional carbon-free and carbon-neutral generation, and improving the transmission capacity serving the state;

8. Make state government a model for energy efficiency, use of clean and renewable energy, and greenhouse gas-neutral operations; and

9. Maintain and enhance the state's existing energy infrastructure.

The use of our state's roof tops for generating solar electricity is an important method of helping to achieve many of these state-wide renewable energy goals.

Rooftop Solar Challenge
The Department of Commerce is working with 4 local governments, 4 utilities and non-profit organizations to develop a standardized approach to permitting, zoning and interconnection through a grant from the U.S. Department of Energy. The Washington State project is one of 22 in the nation. Improving permitting procedures for solar PV systems is one part of the broader SunShot Initiative to make solar installations more competitive with traditional energy resources.

State law provisions protecting solar access
The Washington state legislature has gone to efforts to identify the protection of access to direct sunlight for solar energy systems as a legitimate public interest. The TAG and the State Building Code Council should acknowledge these legitimate state interests during the 2012 IFC process:

A basic statement of support for maintaining solar access to properties is contained in RCW 64.04.140 - *The legislature declares that the potential economic and environmental benefits of solar energy use are considered to be in the public interest;* ***therefore, local governments are authorized to encourage and protect access to direct sunlight for solar energy systems.***

State law regarding comprehensive plans puts access to direct sunlight on a par with fire regulations: RCW 35.63.090 - *All regulations shall be worked out as parts of a comprehensive plan which each commission shall prepare for the physical and other generally advantageous development of the municipality and shall be designed, among other things, to encourage the most appropriate use of land throughout the municipality; to*

lessen traffic congestion and accidents; to secure safety from fire;… ***to encourage and protect access to direct sunlight for solar energy systems;*** *…*

An additional state law regarding municipal authority puts solar access on an equal footing with all the other things that city and county land use ordinances regulate: RCW 35A.63.100 - *Such ordinances or other action may provide for: … (2) Dividing the municipality, or portions thereof, into appropriate zones within which specific standards, requirements, and conditions may be provided for regulating the use of public and private land, buildings, and structures, and the location, height, bulk, number of stories, and size of buildings and structures, size of yards, courts, open spaces, density of population, ratio of land area to the area of buildings and structures, setbacks, area required for off-street parking,* ***protection of access to direct sunlight for solar energy systems****, and such other standards, requirements, regulations, and procedures as are appropriately related thereto. (Note - emphasis added).*

Approval criteria (4) The amendment is needed to address a unique character of the state:
The 2012 IFC contains provisions requiring a three foot "ventilation setback" from the peak of pitched roofs for one and two family homes and greater width for multifamily and commercial buildings. Many parts of the state receive significant snow accumulation during the winter months. The ventilation setback may result in snow and ice accumulation above the PV array potentially creating ice dams. Ice dams can result in roof leaks and building damage. This issue should be carefully reviewed and addressed during the adoption process. The 2012 IFC is based upon southern California solar guidelines where snow accumulation is not an issue. This is a significant oversight of the 2012 IFC and should be corrected in any version of the code adopted in Washington.

C. **TYPE OF BENEFITS PROJECTED:**

Desired benefits of the proposed amendment are:

1. Simpler permit process for solar PV installations;
2. Clearer standards for local jurisdiction permit authorities;
3. Fewer impacts to home and business owners seeking to maximize the solar potential of their property;
4. Keeping solar PV system costs as low as possible in order to generate the maximum power possible;
5. Accommodating both the needs of firefighters (based upon local firefighting practices and policies) and the state's goals of generating renewable energy on sunny rooftops;
6. Avoiding snow damage to sloping building roofs potentially caused by ventilation setbacks.

Please see the discussion above for more details.

Attachment III: Part IV - Amendment Costs and Benefits

Power Trip Energy Corp Application for IFC Code Amendment

Building Type	Construction[6]		
	Costs	% impact[4]	Benefits[5]
Residential	See Attachment IV Cost/ Benefit Case Studies	See Attachment IV Cost/ Benefit Case Studies	A) User benefits & B) Public benefits. Proposed amendments would save an estimated $2,600 per homeowner who installs a solar PV system. (see Attachment III – cost/benefit case studies). The proposed Amendments seek to maintain the status quo, keeping all sunny roof area on a home available for solar PV. If the IFC is implemented as proposed it would reduce the average home PV system by approximately 11% in power. C) Industry benefits. The proposed amendments would reduce impact of 2012 IFC upon available residential roof area that may be used for solar PV installations. IFC as written would impact approximately 60% of all residential solar PV installations, reducing the potential power of the PV system and/or increasing the cost. D) Economic benefits. Solar PV systems generate electricity with no carbon emissions and have a long lifetime (30 or more years) with little or no maintenance. Residential roof-top installations are the most common method used in WA state.
Single family	Same as above	Same as above	Same as above.
Multi-family			The proposed IFC would have a negative impact upon the solar resource of multi-family buildings with sloped roofs, but these impacts have not been quantified. This should be addressed prior to Adoption of the 2012 IFC. The proposed amendments as submitted do not address multi-family buildings, but additional information may be submitted on this issue.
Commercial/Retail			The proposed IFC would have a negative impact upon the solar resource of commercial buildings with sloped roofs, but these impacts have not been quantified. This potential impacts should be addressed prior to adoption of the 2012 IFC. The proposed amendments as submitted do not address commercial buildings, but additional information may be submitted on this issue.
Industrial			The proposed IFC would have a negative impact upon the solar resource of industrial buildings with sloped roofs, but these impacts have not been quantified. This potential impacts should be addressed prior to adoption of the 2012 IFC. The proposed amendments as submitted do not address industrial buildings, but additional information may be submitted on this issue.
Institutional			The proposed IFC would have a negative impact upon the solar resource of institutional buildings with sloped roofs, but these impacts have not been quantified. This potential impacts should be addressed prior to adoption of the 2012 IFC. The proposed amendments as submitted do not address institutional buildings, but additional information may be submitted on this issue.

[1] $ / square foot of floor area or other cost. Attach data. **Construction** costs are costs prior to occupancy, and include both design and direct construction costs that impact the total cost of the construction to the owner/consumer.

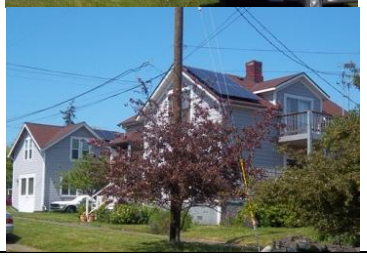
[2] Cost per project plan. Attach data. **Enforcement** costs include governmental review of plans, field inspection, and mediated litigation required for enforcement.

[3] Cost to building owner/tenants over the life of the project.

[4] Cost differential over a specific size project or range of projects as determined by the proponent. Provide sufficient cost and benefit detail to clarify the impact to the Council. All data should be created and referenced to third party reputable sources for verification.

[5] Note sectors with measurable benefit from Part II, including benefits to a) the user, b) the public, c) the industry, and/or d) the economy; use e) for all of the above.

Attachment IV - Cost Benefit Case Studies
25 Solar PV Systems Installed by Power Trip Energy

	Photo of Home	Name and Location	System Size	Impact of 2012 IFC Section 605.11	% Reduction in Power	System Lifetime Impacts[1]
1	 	Ericksen residence – Sequim	4.8 kW – Sharp 240 watt modules (made in USA)	Would eliminate 12 out of 20 solar modules	40% power reduction	$13,025 in lost energy savings over 30 years.
2		Kaye residence – Sequim	4.29 kW – Silicon Energy modules (made in WA)	Would eliminate 1 solar module	5% power reduction	$2,357 in lost energy savings over 30 years.
3		Dent farm – Kingston	4.68 kW Silicon Energy ground mount (made in WA)	Ground mount. No impact	No impact	No impact
4	 	Becker residence – Port Townsend	3.3 kW Sanyo modules (made in USA)	2012 IFC would eliminate 11 out of 15 modules	73% power reduction	$9,038 in lost energy savings over 30 years.

5		Hill residence – Sequim	9.36 kW – Sharp modules (made in USA)	2012 IFC would require relocation of 17 modules to lower roof	No impact	Additional cost of $2,000 for more complex system layout.
6		Lundburg residence – Port Townsend	8.47 kW Silicon Energy modules – made in WA	2012 IFC would have eliminated 17 of 44 modules	39% power reduction	$11,027 in lost energy savings over 30 years.
7		Mang residence – Port Townsend	3.9 kW Silicon Energy modules – Made in WA	2012 IFC would have eliminated 4 of 20 modules	20% power reduction	$3,366 in lost energy savings over 30 years.
8	 	Miller-Webb residence – Port Townsend	4.1 kW Silicon Energy – Made in WA	2012 IFC would have eliminated 5 of 21 modules	24% power reduction	$3,443 in lost energy savings over 30 years.
9		Coffeen residence - Nordland	6.44 kW Sharp modules – made in USA	2012 IFC would have eliminated 14 of 28 modules	50% power reduction	$11,243 in lost energy savings over 30 years.

10		Maloney Heights Homeless Apartment Building – Port Angeles	6 kW Silicon Energy modules – made in WA	2012 IFC would have required 4' perimeter around roof & relocation of 16 modules.	Size of array would not be impacted. Relocating modules would increase system cost.	$2,000 additional installation cost.
11		Urness residence – Port Angeles	4.10 Silicon Energy modules – made in WA	2012 IFC would have required 3' ventilation setback from peak.	No impact to system size.	No impact.
12		Sanford residence – Sequim	4.6 kW Solar World modules – made in USA	2012 IFC would have required 3' ventilation setback from peak.	Change in module layout from portrait to landscape orientation.	$800 additional installation cost.
13		Jones residence – Gardiner	2.76 kW Sharp modules – made in USA. Planned for future expansion.	2012 IFC would have required 3' ventilation setback from peak.	Change in module layout from portrait to landscape orientation.	$800 additional installation cost.
14		Merson residence - Port Orchard	2.76 kW Solon modules – made in USA.	2012 IFC would have required 3' setback from peak and 3' setback from roof edge.	Change in module layout that would break array into two sections. No change in array size.	$250 additional cost.

15		Sextro residence - Sequim	4.08 kW Silicon Energy modules – made in WA	2012 IFC would have required 3' setback from peak and 3' setback from roof edge.	5% reduction in power. Relocation of array to shadier portion of roof. No impact to array size.	$2,141 in lost energy savings over 30 years.
16		Giersch residence– Sequim	4.2 kW Silicon Energy modules – made in WA	2012 IFC would have required 3' setback from peak and 3' setback from roof edge.	Change in module layout would break up array into additional sections. No change in array size.	$250 additional cost.
17		Sanders residence – Sequim	6.9 kW Sunpower modules – made in USA	Exempt from 2012 IFC. Detached shed/well house. Group U detached non-habitable structure.	No impact.	No impact.
18		Barton residence – Sequim	9.45 kW SunPower modules – made in USA	Exempt from 2012 IFC. Detached shop/garage. Group U detached non-habitable structure.	No impact.	No impact.
19		Holiday Inn Express – Sequim	10.34 kW Sharp modules – made in USA.	Subject to IFC commercial setbacks.	No impact.	No impact.

20		Gunther residence – Quilcene	3.68 kW Silicon Energy modules – made in WA.	Ground mount no impact.	No impact.	No impact.
21		Vanderhoof farm - Joyce.	10.12 kW SunPower modules – made in WA.	Exempt from 2012 IFC. Detached agricultural building. Group U detached non-habitable structure.	No impact.	No impact.
22		Eldredge - Salamy Residence – Sequim	4.6 kW Sharp modules – made in USA.	2012 IFC would have required 3' ventilation setback from peak.	No impact to system size.	No impact.
23		McClain residence - Sequim	4.7 kW Sharp modules – made in USA.	2012 IFC would have eliminated 6 modules (peak and side setbacks).	30% reduction in power.	$3,236 in lost energy savings over 30 years.
24		Kroll residence – Sequim.	5.64 kW Sharp modules – made in USA.	Exempt from 2012 IFC. Detached shop/garage. Group U detached non-habitable structure.	No impact.	No impact.

25		Gibilisco residence – Sequim.	4.7 kW Sharp modules – made in USA.	2012 IFC would have required 3' setback from peak and 3' setback from roof edges.	5% reduction in power. Relocation of array further down roof into shadier portion of roof. No impact on array size.	$1,279 in lost energy savings over 30 years.
	Totals (averaged) - **40% of projects reduced power.** - **24% of projects additional cost.** - **36% of projects no impact.**			**64% of projects impacted by IFC changes.**	**Average 11.6% power reduction per project.**	**Cost to average project of IFC changes $2,650 over lifetime of solar array.**

[1]System lifetime impacts compares estimated energy generated over 30 years by actual system installed vs. system allowed by the 2012 IFC using same solar equipment and assuming no exceptions for ventilation setback from the peak. Future cost of electricity assumes 5% inflation rate per year. State production incentive program assumed to end in June 30, 2020. Lifespan of solar array assumed to be 30 years. Residual value of system at 30 years and possible maintenance costs were not calculated. 25 Systems represent most recent 25 systems installed by Power Trip Energy in 2011 – 2010 and posted on company web site.