Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

Removing Barriers to Innovation Related Codes and Standards CSI Team

PAM COLE

Pacific Northwest National Laboratory

Building America Technical Update Meeting, April 29-30, 2013, Denver, CO

PNNL-SA-95120

Background/History

Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

Transformation of U.S. housing markets to favor high-performance homes faces significant challenges, from education to technology to infrastructure and cost barriers. Some of the most difficult challenges involve industry codes and standards that may prevent or slow the innovation process.

Building America Research has a history of:

Successful market innovations and transformation
and
overcoming codes and standards barriers.

Top 3 Existing Innovations C/S Challenges

Pacific Northwest NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

***Thermal Bypass Air Barrier Requirements**:* Building America research teams effectively demonstrated the importance of thermal bypass air barriers, which led to their inclusion in ENERGY STAR for Homes specifications in 2006 and then to inclusion in the 2009 IECC. This is a great example of effective research driving complete market transformation for a home building innovation with dramatic impact on home performance. Since complete Thermal Bypass Air Barrier requirements were adopted in the 2009 IECC, close to a million homes have been mandated to include this vitally important energy efficiency measure.

***Unvented Crawlspaces Allowed**:* Prior to Building America, crawlspace ventilation was required by codes throughout the U.S. Yet, ventilating crawlspaces has been shown to waste energy and increase moisture problems in homes. Building America research led to adoption of unvented crawlspace provisions in model codes, encouraging builders to insulate crawlspaces for savings of up to 20% in heating and cooling energy and substantially reducing the risk of moisture problems.

Vapor Retarder Classification: the vapor retarder classification system developed through Building America research has been effectively integrated into the national model codes (IRC and IECC) and now impacts 100,000's of new homes constructed each year so they more effectively control moisture flow and are more durable. Specifically, Building America-sponsored research led to code changes that defined vapor control measures more precisely and paved the way for the codes to clearly specify climate appropriate vapor control strategies, reducing moisture risks in insulated building assemblies.

Vision of Success

Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

Overview of CSI Team

Pacific Northwest NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

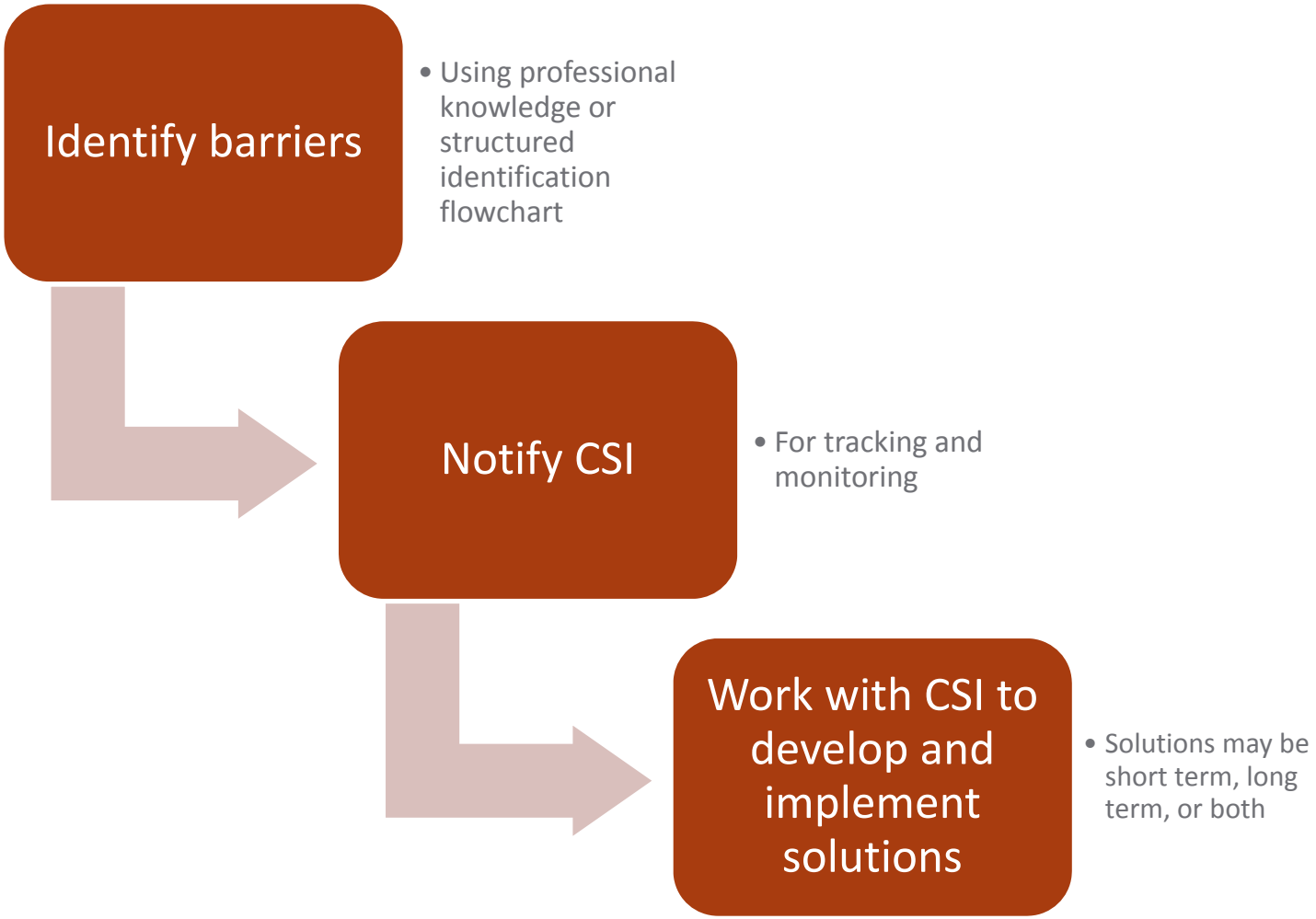
- **A**ssist research teams with identifying and overcoming code and standard barriers to allow innovations to reach the market
- **P**rovide guidance to builders/installers and Approving Authorities to overcome code and standard issues during plan review and in the field
- **E**nsure Building America Solution Center content is directed to the building code audience

MARKET IMPACT

Allowing successful implementation of Building America Innovations that are not prohibited, but encouraged by codes and standards to accelerate those innovations to market.

Overall Process

Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965



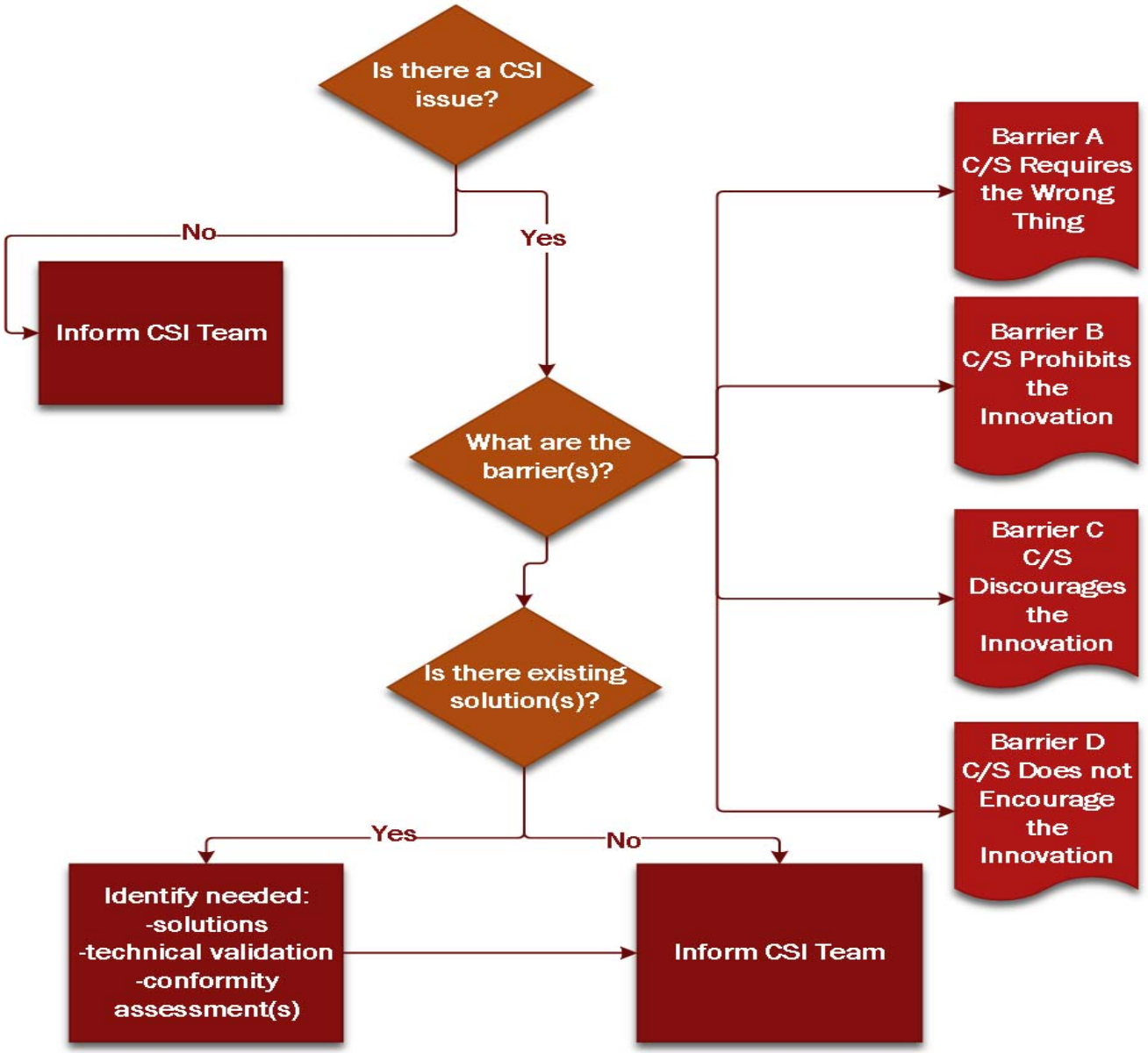
Solution for Various Types of Barriers

Pacific Northwest NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

Barrier Type	Short Term Solution	Long Term Solution
C/S requires the wrong thing	Establish technical argument for why code/standard is wrong **AND** argue based on common sense	Develop code/standard change that does not require the wrong thing (and hopefully requires the "right thing")
C/S prohibits the innovation	Establish equivalent or better performance of innovation **AND** argue blanket prohibition is against alternate materials and methods clause	Develop code/standard change that removes prohibition
C/S discourages the innovation	Establish equivalent or better performance of innovation	Develop code/standard change that removes discouragement of innovation
C/S to encourage innovation does not exist	Establish technical argument for why it should be encouraged and equivalent or better performance of innovation	Develop code/standard change that encourages innovation

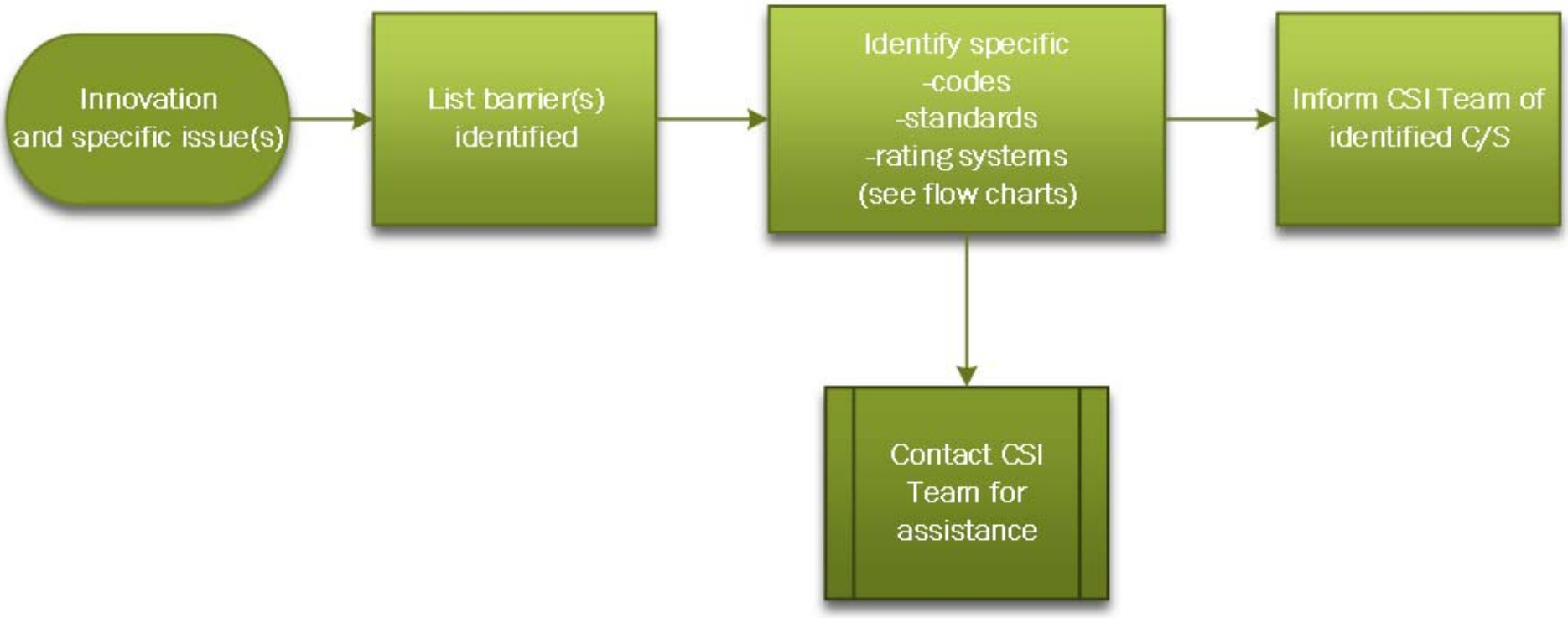
Building America CSI Process

Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965



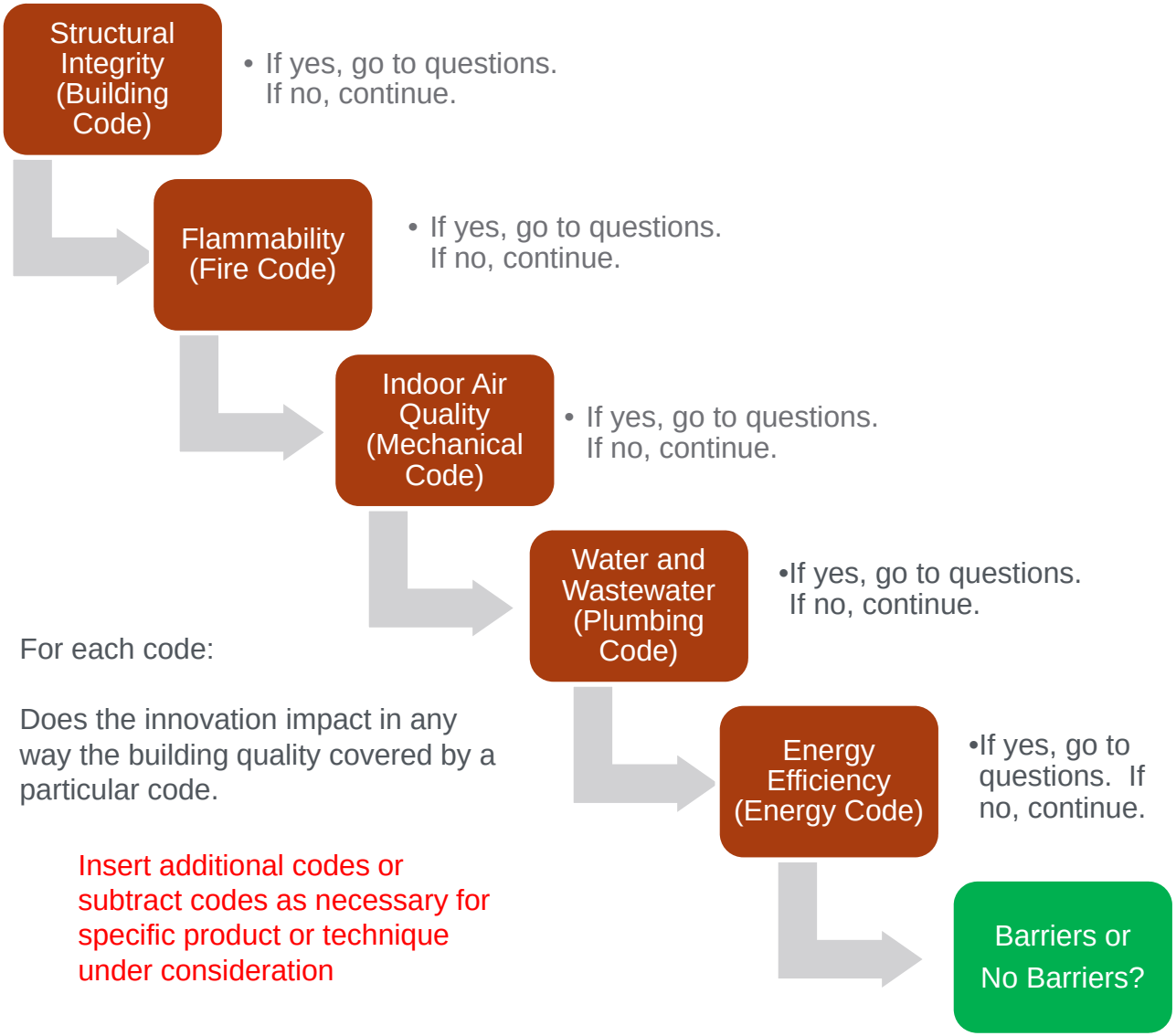
CSI Identification Process

Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965



Identifying of Code Barriers

Pacific Northwest NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965



For each code:

Does the innovation impact in any way the building quality covered by a particular code.

Insert additional codes or subtract codes as necessary for specific product or technique under consideration

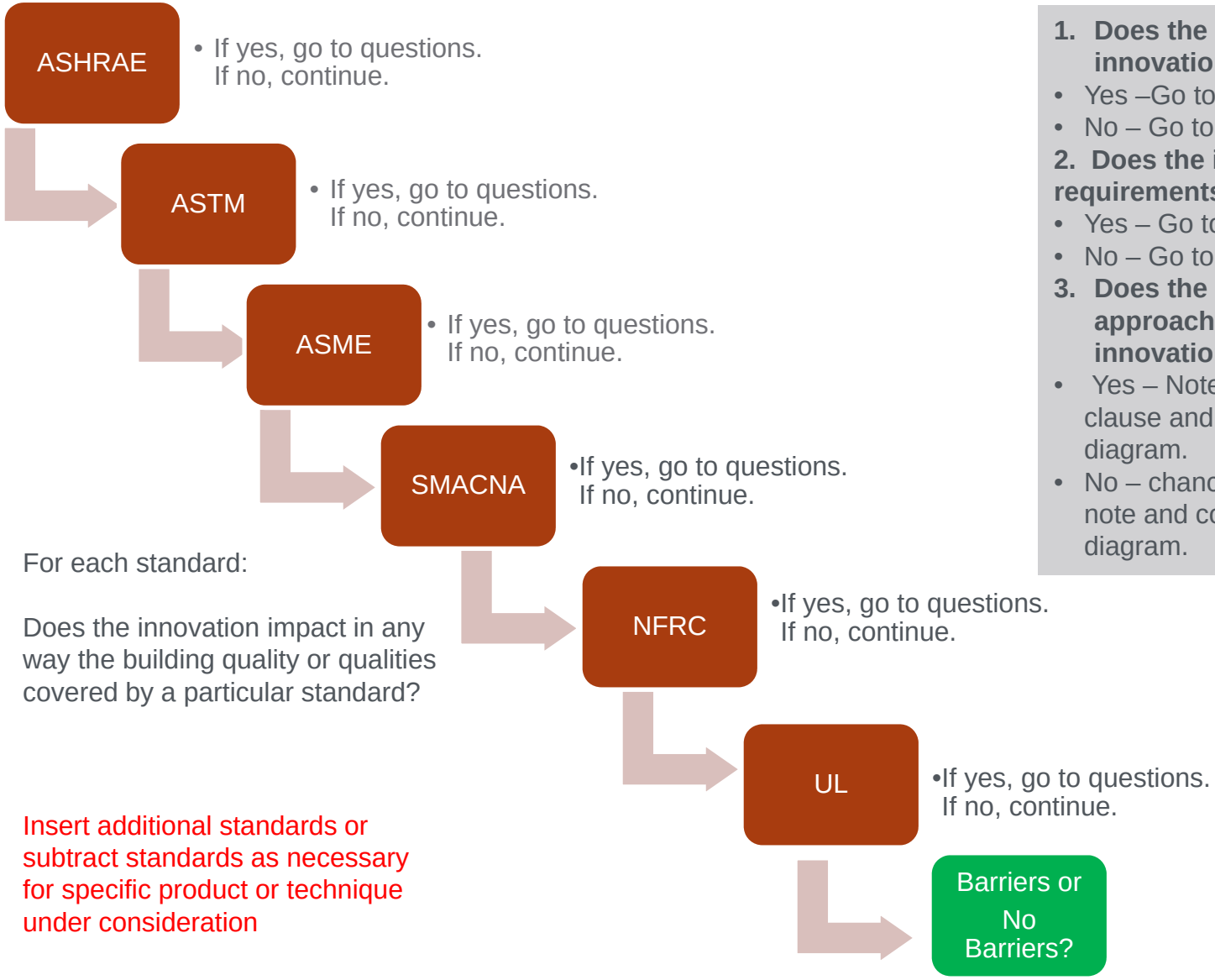
1. Has innovation been tested to determine impact on the building feature addressed by the code?
- Yes – Go to next code in diagram. Go to question 2.
- No – chances are good a code barrier exists – note and continue to next code in diagram.

2. Is the innovation specifically listed as an allowable alternative in the building code?
- Yes – Go to next code in diagram.
- No – Go to question 3.

3. Could the innovation be considered an allowable alternative if sufficient information on innovation performance is provided?
- Yes – Identify necessary information needed and go to next code in diagram.
- No – chances are good a code barrier exists – note and continue to next code in diagram.

Identifying Standard Barriers

Pacific Northwest NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965



For each standard:

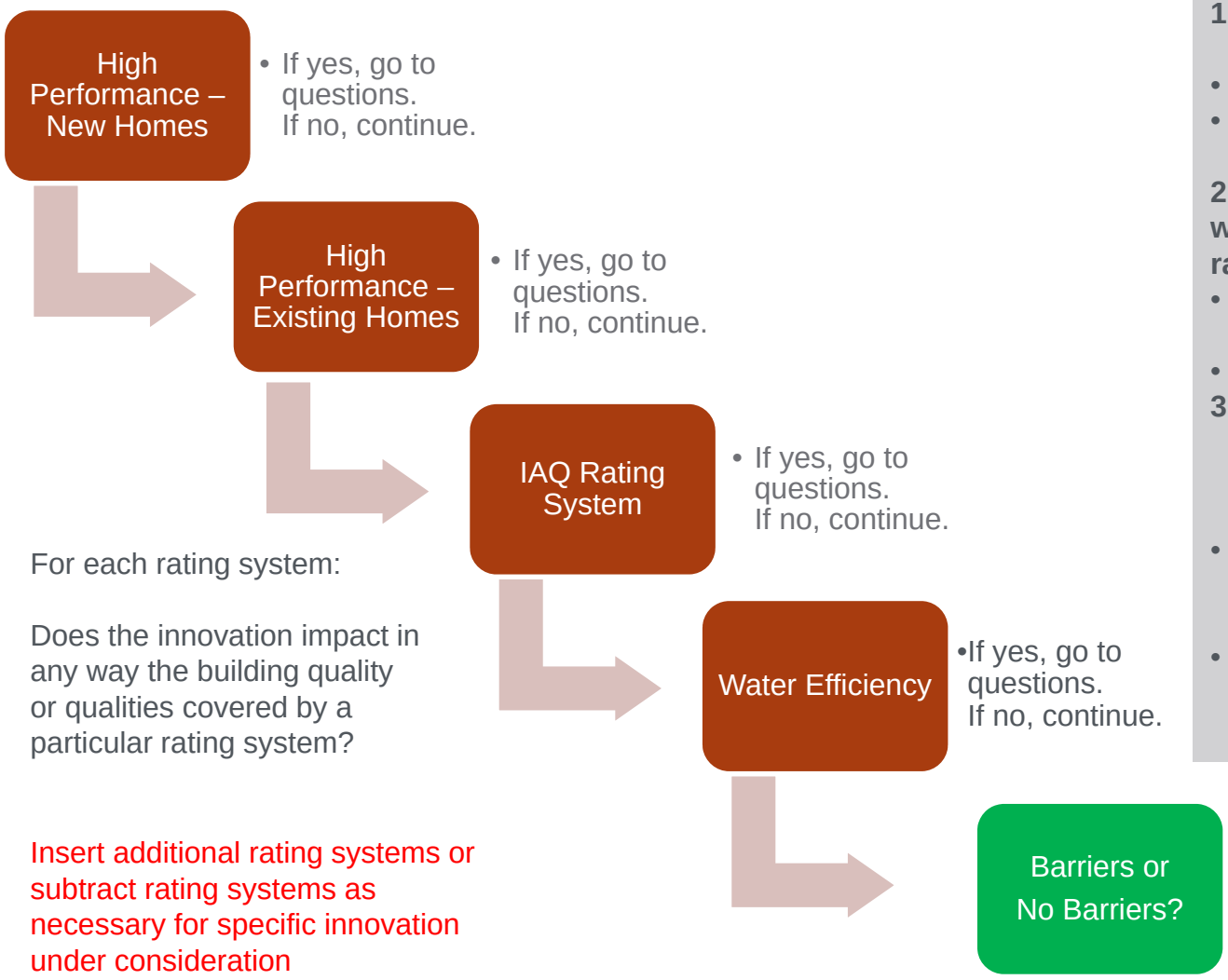
Does the innovation impact in any way the building quality or qualities covered by a particular standard?

Insert additional standards or subtract standards as necessary for specific product or technique under consideration

1. **Does the standard apply to the innovation?**
   - Yes –Go to question 2.
   - No – Go to next standard in diagram.
2. **Does the innovation meet whatever requirements are in the standard?**
   - Yes – Go to next standard in diagram.
   - No – Go to question 3.
3. **Does the standard have an alternate approach clause that could allow the innovation to meet the standard?**
   - Yes – Note use of alternate approach clause and go to next standard in diagram.
   - No – chances are good a barrier exists – note and continue to next standard in diagram.

Identifying Rating System/QA Barriers

Pacific Northwest NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965



For each rating system:

Does the innovation impact in any way the building quality or qualities covered by a particular rating system?

Insert additional rating systems or subtract rating systems as necessary for specific innovation under consideration

1. **Does the rating system apply to the innovation?**
   - Yes –Go to question 2.
   - No – Go to next rating system in diagram.
2. **Does the innovation meet whatever requirements are in the rating system?**
   - Yes – Go to next rating system in diagram.
   - No – Go to question 3.
3. **Does the rating system have an alternate approach clause that could allow the innovation to meet the rating system?**
   - Yes – Note use of alternate approach clause and go to next rating system in diagram.
   - No – chances are good a barrier exists – note and continue to next rating system in diagram.

Offensive/Defensive/Proactive

Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

- **A**ssist research teams with identifying and overcoming code and standard barriers to allow innovations to reach the market
  - Creating a structure for identifying and capturing codes and standards barriers
- **P**rovide guidance to builders and installers to overcome code and standard issues in the field
  - Developing technical validation for alternative materials and compliance
- **E**nsure Building America Solution Center content is directed to the building code audience
  - Deploying materials to accelerate implementation and adoption

What's Next???

Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

Questions/Comments/Suggestions???

Pam Cole
Pacific Northwest National Laboratory
(509) 375-6787
pam.cole@pnnl.gov