

Topic	Draft 2/Usability Metric/RI Discussion Document Version 1.0 Climate Controls Comments	EPA Response/Draft 3 Version 1.0 Climate Controls Specification Proposal
<b>Draft 2 Comments</b>		
<b>Partner Commitments</b>		
Qualifying Product	<p>“2.C Product packaging must include “Residential Climate Control – This product is designed only for use in homes and other dwellings.”</p> <p>We are deeply aligned on the goal to be clear about the intended usage environment for the product: for homes. However, we have two concerns. 1) We think that an intelligent Energy Star thermostat will work efficiently and intuitively in many light commercial environments. 2) If the EPA feels that differentiation is required, we recommend either a requirement for “clear labeling” or shorter alternative such as “This Energy Star thermostat is rated for home use only.”</p>	<p>EPA has removed the product packaging requirement to identify the product as for only Residential use. However, the residential scope of the specification has not changed. The default HVAC schedule, with setback periods during typical daytime working hours, is intended for residential use.</p>
	<p>We now recommend that all candidate residential climate controls undergo the performance-based usability test. The only way to ensure that all approved devices will be sufficiently usable is to subject all devices to the performance-based path.</p>	<p>EPA agrees it would be ideal for all Climate Controls to go through the performance based test. We expect the additional flexibility afforded by the performance based path to be attractive to many manufacturers. However, EPA has no compelling evidence to convince us not to provide a lower cost prescriptive path for products to demonstrate ease of use. EPA will review all aspects of the specification during future revisions and may consider changes to the qualification paths for ease of use.</p>
Logo	<p>RE: “The ENERGY STAR mark must be clearly displayed on the front of the product,” We fully support the Energy Star program and intend to create visibility for the Energy Star mark online, in our manuals, and on our packaging. The co-marketing benefits are clear and we intend to support these objectives. However placing the mark on our product is prohibitively challenging from a space and branding standpoint. We recommend removing the requirement for displaying the logo on the front of the product.</p>	<p>In order to ease the labeling burden for Residential Climate Controls, Climate Controls may use temporary labeling, as is permitted for other product classes. For your reference, a copy of the Partner Commitments showing this change (as well as program-wide formatting changes) is included with the Draft 3 proposed requirements.</p>
<b>Definitions</b>		

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Definitions	<p>“Demand Response” – NAESB defines this term for the residential space as the following: “Changes in electric use by demand-side resources from their normal consumption patterns in response to changes in the price of electricity, or to incentives designed to induce lower electricity use at times of potential peak load, high cost periods, or when system reliability is jeopardized.”</p>	<p>As a result of revisions to the specification, a number of defined terms, including Demand Response were no longer referenced and have been removed from the Draft 3 spec.</p>
<b>General</b>		
HAN Communications	<p>If a thermostat is certified in anticipation of the release of a specific communications module, and it subsequently turns out that the thermostat is incompatible with most or all available communications modules, or that the thermostat is designed to use a module that is never actually produced, how will these situations be handled?</p>	<p>EPA recognizes that there are uncertainties associated with this requirement. The introduction of communications modules is ineradicably tied to market demand for them, and as such includes inherent unpredictability. However, there are also disadvantages to the alternative of requiring all Climate Controls to ship with communications, with no provision for upgradability. The standards and market for communication are rapidly evolving, and EPA will reexamine this requirement in the next specification revision, expected to be within a couple years of V1.0 being finalized.</p>
Require as-shipped communications	<p>If the purpose of Energy Star specifications is to encourage and reward advanced design and engineering that lead to energy savings, then we believe that it is perfectly appropriate to require as-shipped communications capabilities.</p> <hr/> <p>EPA should mandate that all Residential Climate Controls be sold with communications enabled.</p>	<p>Thank you for your comment. Stakeholders have shared analyses with EPA that show that communications can enable significant energy savings. Draft 3 retains the proposal that non-communicating upgradeable units can qualify, due to significant uncertainty about communications standards. We note, however, that the power limit for communicating units is difficult to test for those that are not sold with communications enabled, and one potential solution to that problem is to require communications for all units. We expect to continue this discussion as the specification process continues.</p>

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Prescriptive Requirements	Core Prescriptive Requirements: Do products meeting the proposed requirements consistently yield consumer behaviors that save energy?	EPA is actively seeking energy saving results associated with many aspects of the proposed requirements. However, as there are currently no qualified products, we are limited in our ability to do the research. EPA expects to reexamine these requirements as more data becomes available after the specification is released.
<b>Core Usability Requirements</b>		
Date & Time	If a Climate Control is integrated into an EMS/ESI/AMI system that automatically sets time and date upon installation for greater usability and repopulates the time and date after a power outage is it necessary to maintain time during the power outage? If so what is the purpose of maintaining time during the power outage?	The Climate Control requirements are written so as to provide a functional unit even if the device never connected, or loses connectivity. The purpose of maintaining time sync during a power failure is to continue to run a schedule in the absence of connectivity, in the event that power is restored to heating and cooling equipment before connectivity is restored. The specification now specifies that network time sync override the device's local timekeeping.
	More advanced residential climate controls may have the ability to know the home's exact time zone and DST rules, e.g. from a customer-entered Zip Code or city. In those cases, the ability to manually cancel DST should not be required, as the climate control would already know not to apply DST for the home's location. As the requirements are written, it is not clear that such an automatic time zone/DST detector would qualify, and it most certainly should.	
Low Battery Indicator	The low-battery indicator should only apply to products that use batteries as a source of power for the climate control.	EPA added a clarification to specify that this requirement only pertains to devices that use non-rechargeable batteries.
<b>Prescriptive Requirements</b>		

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Long-Term "Away"	EPA should remove the requirement for single-action Long Term Hold activation from the prescriptive requirements. Instead, EPA should mandate quick access to Short Term Hold. When long-term hold is the default, it is common for people to leave their home in a comfort setting while they are away so that they do not return to an uncomfortable house.	Prescriptive criteria 3.D.2.a is intended to ensure easy access to "Away" mode. Away mode is, by design, simultaneous activation of an energy saving setpoint and long term hold. EPA believes this combination to be appropriate as the energy saving mode should be maintained until cancelled by the user, rather than be potentially overridden by the HVAC schedule in a vacant home. Note that the Away mode setpoints are limited in adjustability to prevent the use of a comfort setpoint with Away mode.
Visual Indication of HVAC Mode	Please note that the energy consumption of a residential heating system is generally discrete, i.e. Off, Stage 1 active, Stage 2 active, etc. The example illustration shown here is continuous, suggesting that the HVAC system could be at any value in between \$\$\$ and \$.	EPA agrees with this comment, however, the graphics shown in the Draft 2 specification and repeated in the Draft 3 specification are presented as examples, only. Stakeholders are encouraged to use other more effective and appropriate means for conveying relative cost of operation.
Single User Action	One of the goals for the residential climate controls specification should be to shift consumers from the paradigm of manual temperature adjustments to programmed schedules, which offer tremendous efficiency benefits. EPA should not encourage users to change their setpoint using a single user action.	There are many reasons for homeowners to adjust the temperature. EPA's experience leads us to believe that user behavior is most effectively influenced by improving accessibility to energy saving functions rather than removing control from users. Adjusting the setpoint is considered by EPA to be core functionality; as such, EPA retains the proposal that it can be done with a single user action.
Indication of Current operating mode	EPA should not require that all current operation information be displayed persistently on the interface, but operation information should instead be prioritized and easily accessible for clarity and effectiveness.	This display is not required to be persistent or to be present on the default or home screen. In addition, the requirement that it be indicated only applies to the prescriptive path.

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Energy Rate Tier Display	EPA should remove the colored LED pricing tier indicator requirement from the prescriptive requirements.	EPA has removed this requirement due to lack of support from utility stakeholders. However, EPA continues to believe that the Climate Control provides an excellent opportunity to display utility messages and pricing information.
<b>Technical Requirements</b>		
Outdoor Temperature Data	<p>Regarding the following clause in 3.14: "The product shall have access to outdoor temperature data. For Dual Fuel Heat Pump installations, the Residential Climate Control shall use the outdoor data to provide automatic cutover to/from the backup heat source based on installer configurable cutover temperatures."</p> <p>As this reads any product supporting dual fuel heat pumps will be required to ship with support for outdoor weather. This adds to the complexity and cost of every single unit. We suggest modifying to read, that thermostats supporting dual fuel heat pumps "...will be capable of using outdoor data to provide automatic cutover..."</p>	EPA has amended this language to pertain only to products that support dual-fuel heat pump installations. In addition, access to outdoor temperature data could be via an outdoor temperature sensor, but other means are also acceptable, for example, access to local weather data through communicating functionality.
Humidity Sensing	Humidity control could save energy in some climates, particularly in unoccupied homes where temperatures are allowed to float but humidity must be controlled in order to manage IAQ and prevent mold or mildew. The potential energy savings sought by EPA will only be realized if customers: a) understand how to correctly utilize the humidistat functionality, and b) choose to maximize savings over comfort. Based on the experiences of some committee members in humid climates, CEE is concerned that in the majority of cases, both of these conditions will not be satisfied, increasing the likelihood of increased energy use.	<p>EPA recognizes that the requirement to monitor and display humidity levels may pose a financial burden for climate control manufacturers and agrees that it facilitates seasonal energy savings in only in certain climates or particular seasons. Therefore, EPA has removed criteria for humidity sensing and display from the Draft 3 Climate Control specification.</p> <p>EPA notes that there is significant individual savings potential associated with Residential Climate Controls that include the ability to control HVAC equipment based on temperature and humidity in certain use cases, e.g. unoccupied homes in hot humid regions. Thus, EPA encourages manufacturers to include this feature set in certain models.</p>
	Consider that humidity measurement increases cost and complexity and potentially decreases usability. If humidity measurement and display have no defined or mandated control parameters.	
	Section C.15: This statement is vague. It is appropriate for maintaining desired humidity levels in the HEAT mode but not in the COOL mode. During cooling the need is to limit the maximum humidity to prevent mold and mildew formation, not to maintain humidity levels.	

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Watt Limit	We deem the power limits set by EPA for communicating climate controls to be acceptable given current communications technologies.	EPA appreciates this comment in support of selected power consumption limits.
Scheduling	Regarding: "3.19 Shall use the names: "Morning," "Day," "Evening," and "Night."" We suggest a more flexible alternative that supports both clarity and innovation. "...shall display either times, icons and/or the descriptive names Morning, Day, Evening and Night." An Alternative would be to include the naming in the prescriptive path and alternatives in the performance-based path. Regarding: "3.19 Shall use the names: "Morning," "Day," "Evening," and "Night.""	Several stakeholders have requested that EPA allow manufacturers to determine how best to describe or name Climate Control schedule periods. EPA agrees that this will enable innovation in usability, and has eliminated the requirement for specific schedule period nomenclature.  The draft retains the default HVAC schedule requirement, and the requirement of capability for 7-day scheduling with 4 or more periods per day. This should not be interpreted as a need to present to consumers a rigid 7-day 4-period schedule that must be completed - other approaches hold great promise for increasing usability.
	All manufacturers should be free to deviate from the recommended schedule period nomenclature. The lack of flexibility in terms of labels constrains creativity and innovation. If usability is EPA's concern, then this requirement should instead be in the prescriptive usability requirements section and should be judged by the performance-based test for devices choosing that path.	
Recovery Algorithm	The ability of a remote service to optimize HVAC usage is likely to be severely compromised if a given thermostat is locked into recovery mode, which can interfere with the ability of a remote service to properly optimize based on outside weather. We therefore strongly recommend that any pre-programmed recovery mode should be accessible by software command accessible to consumer-enabled outside management services.	Criteria for recovery algorithms are consistent with that included in the previous ENERGY STAR Programmable Thermostat specification. EPA believes it critical that qualified products deliver upon consumer expectations for comfort as well as energy savings. Default recovery algorithms have been set with the intention that comfort setpoints be achieved in an energy saving manner at or very near to the start of each comfort period. There are significant energy use risks for heat pump installations:  1. if the consumer finds the home is still too cold at the start of

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	<p>The EPA should remove the requirement that “Recovery, Adaptive” be the default algorithm. Seeing the impressive presentation from ADT at the December stakeholder meeting and learning that devices like it do not support “Recovery, Adaptive” imply that “Recovery, Adaptive” should not be mandated as the default algorithm.</p> <p>Based on end user research there will be significant end user/installer confusion when communicating the difference between adaptive recovery and recovery. In addition, the inclusion of this methodology adds unnecessary complexity (and cost) to the device. We ought to ask ourselves if the little energy savings are worth the trade-off for more end user confusion?</p> <p>Clearly, the answer is no from a mainstream end user point of view.</p>	<p>a comfort period and calls for auxiliary heat, or</p> <p>2. if the Climate Control itself calls for aux. heat for recovery.</p> <p>However, stakeholders have advised EPA that advanced energy management systems are capable of minimizing energy consumption through remote management of the Residential Climate Control. These systems may dynamically vary recovery rates, recovery periods and setback setpoints to minimize energy usage for homes on an individual basis. Thus, in the Draft 3 specification, EPA has included an exception that allows control systems to manage recovery in connected Communicating Climate Controls.</p>
<b>Communication Requirements</b>		
Program Requirements	<p>Regarding: “3.20 A SDK, or Interface Control Document, as appropriate available to...”</p> <p>We recommend eliminating the requirement for an SDK and change to “an Interface Spec.”</p>	<p>In response to stakeholder input, EPA has proposed the following language: “Suitable documentation such as an application programming interface (API) or Interface Specification shall be available to 3rd party developers to enable access to the product’s data reporting and remote management capabilities, as defined below in Sections 3.B.3 and 3.B.4.”</p>

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External Communication	<p>EPA should ensure that the periodic data retrieval values are not in conflict with common Open Standards, e.g. ZigBee SE. Most of these data points are currently not supported through standard ZigBee SE messages.</p>	<p>In order to drive both open access and interoperability, EPA strives to encourage the use of appropriate open communication standards, as well as to include consistent criteria across different ENERGY STAR product categories. As such, in this draft, EPA has added a recommendation for the use of standards included within or being considered for inclusion within the SGIP Catalogue of Standards and/or adopted by a well established Standards Developing Organization (SDO). However, EPA also recognizes that much current standards activity is focused on Smart Grid functionality rather than remote management, or data exchange in support of energy use optimization. EPA recognizes that mandated communications criteria cannot currently be accomplished through standard protocols in all cases. EPA believes standardization activities will eventually offer more comprehensive common command sets, appropriate for remote management and energy use optimization. In light of this situation, criteria requiring stakeholders release an interface specification or API will ensure interested parties are able to access key product features over the communication link.</p>
Remote Control Commands	<p>3.23 "Product shall be "capable" of accepting "remote control" commands enabling near-real time (roughly 5 seconds) settings changes."  We recommend clarifying by adding "Once the thermostat receives a command to change, it will respond to that command within 1 second."</p>	<p>For both consumer satisfaction and in order to unlock energy management opportunities, EPA believes it critical for Communicating Climate to respond quickly to remote commands. EPA acknowledges, however that the Draft 2 criteria does not properly account for variable network latency</p>

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	<p>For products that rely on batteries for power, the remote access control time threshold should be 15 minutes, not 5 seconds. Alternatively, EPA should offer different thresholds based on whether the Residential Climate Control relies exclusively on batteries for power. While quick responses to authorized commands are certainly desirable from a user experience perspective, the reality is that wireless PCTs without a 24 VAC common "C" wire connection will drain the batteries in much less than 12 months if a 5-second update frequency is required.</p>	<p>and has thus revised the criteria to read, "The product shall respond to the following remote control commands from authorized devices or software applications within 5 seconds. This criterion assumes receipt of the signal within 1 second of its transmission."</p>
<b>Ease of Installation Requirements</b>		
Battery Power	<p>3.27 Shall use commonly available batteries.</p> <p>We recommend that this requirement be changed to "Product that use nonrechargeable batteries, shall use batteries that are commonly available."</p>	<p>EPA agrees and has changed the text accordingly.</p>
	<p>Requirement #28 provides the following: "The product shall be designed for a typical battery life of a minimum of 12 months. This requirement is only applicable to products that use batteries." Because many communicating thermostats do not run off of batteries, this requirement may be limited in its impact. The specification should make it clear that such devices can continue to use batteries for some but not all functions, or to be flexible in power source choices for communicating devices.</p>	<p>EPA has revised battery requirements to apply only to products that use non-rechargeable batteries. EPA recognizes that battery usage will vary in different products but prefers to set consistent criteria wherever possible. Consistent with a stakeholder comment, EPA did consider appropriateness of a 12-month battery life for products that are wholly powered by batteries, however, also believes the requirement to be appropriate for products that use batteries for backup, only.</p>
	<p>Is the 12 month battery life requirement reduced if batteries are tasked to maintain the clock for 7 days or more during a power outage?</p>	
<b>Usability Test Comments</b>		
<b>Usability Test - General</b>		

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General	During the stakeholders' meeting in December, the only estimated price offered for a testing panel such as this was \$20,000-40,000. That amount is excessive, especially when compared to other certifications for devices in the space, such as ZigBee Smart Energy Profile certification, which typically costs less than \$5,000.	The cost of testing will be addressed during the draft 3 webinar and in future discussions as well. As more laboratories earn EPA recognition to perform the climate controls test, EPA believes this will provide manufacturers with more choices that will reduce the initial testing cost.
Usability	Incorporate Focus Group—or Similar User Group Testing—Into the Specification Development Process	EPA's efforts to define a performance-based test of usability will allow manufacturers to use such tools to development innovative products with radically improved ease of use. Such innovation is particularly suited to a free market mechanism where parties compete to provide users with exceptional experience. While there are prescriptive ease of use requirements in this version of the specification, which might be improved by such testing, EPA anticipated moving more firmly towards performance based test in the future, and so will not invest in such testing. To whatever extent is possible, EPA will use results from the round robin to inform level setting.
	A successful usability evaluation program will be one which is based on the smallest possible meaningful set of usability measures, keeping in mind the intrinsic subjectivity of human factors and that the market forces will filter out the products which do not possess reasonable usability.	Consistent with this comment EPA has mandated a small core set of ease of use tasks and limited the size of the panel in order to control testing costs while maintaining acceptable repeatability.
<b>Usability Test - Panel Composition</b>		
General	EnergyHub recommends that the demographics of the test panel be adjusted to match the demographics of people living in homes where the heating and/or cooling is actually controlled by a thermostat or thermostat-like device.	EPA shares with stakeholders the goal of developing the least costly test that differentiates products that will have different energy saving results, on average, once installed. For the draft 3 specification, EPA retains a 28-member panel based on

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	<p>We recommend the following additional criteria by included in the panel qualification:</p> <ul style="list-style-type: none"> <li>• Vision</li> <li>• Hearing</li> <li>• Manual dexterity</li> <li>• Literacy</li> <li>• Speech</li> </ul> <p>Given the nature of the test, it is critical that the panelists be able to see, hear, and manipulate objects at a normal ability level.</p>	<p>only US demographics. EPA welcomes additional feedback demonstrating that a different panel composition would improve differentiation, impartiality, and predictive power without significantly increasing testing burden.</p>
Reference Device	<p>If cost were not a factor, EnergyHub would recommend that the test described be used. However, if a reference device would lead to an equally accurate and cheaper test, EnergyHub strongly opposes an industry-designed virtual reference device</p>	<p>EPA has elected not to pursue development of a reference device for this reason. Development of a reference device is unlikely for the Version 1.0 specification.</p>
Script	<p>The test description should avoid the use of uncommon terms.</p>	<p>EPA has taken steps to limit the complexity of each task. For example, it was determined that some test participants had difficulty with the compound sentence structure in task two. As a result, task 2 was split into task 2 and 3.</p>
	<p>The original proposed test protocol stated the tasks were ordered from easiest to hardest. Though there is rationale for this approach, other compelling factors should be taken into consideration. For example, the tasks should have a logical order to a new user.</p>	
	<p>Task 2 required people to read the current temperature and to read the temperature to which the unit was set to maintain. This task appeared to be problematic for some participants based on the unit design (participants reversed the meaning of the two display elements).</p>	
Speaking English	<p>While it is important that ENERGY STAR products serve the vast majority of Americans, including individuals who speak English “less than very well” in the panel would represent a bias against manufacturers pursuing the performance-based path, as the prescriptive path has no requirements to support the needs of individuals who speak English “less than very well.”</p>	<p>While EPA will not mandate user selection based on language ability; we encourage stakeholders to develop product that is highly usable to a user base that may vary in language, physical and cognitive capabilities.</p>

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Objectivity	EPA should specify as well "No conflicts of interest with the third party performing the test.	The ease of use test method included in the draft 3 specification includes the following individual user criteria that should address this commenter's concern, "No other conflicts of interest that could unfairly influence test results"
<b>Test Procedure</b>		
Administrator Requirements	Having an administrator with a stopwatch may put more pressure on the participants than they would face in their own homes, leading to unnecessary errors. EnergyHub recommends that one administrator should play the role of facilitator by reading directions, setting up the UUT, etc., and a second individual should record notes and keep time.	EPA agrees and notes that the test method included as part of the draft 3 specification requires that the administrator recording task time not be in plain sight of the test participant. It is suggested that this administrator could be observing thru a 1-way mirror or viewing a video feed. Retaining video records might improve accuracy, but may require more rigorous human subject protocol review due to privacy concerns, and seems likely to cost more. EPA would welcome additional stakeholder feedback on this suggestion.  In addition, EPA added a provision in the test method that specifically instructs the test administrator to hide the unit under test (UUT) from view until the test participant is asked to complete the task.
	Time (and verification review) would gain greater accuracy if the session was recorded and the time from the video was used instead of a stop watch. This could also lead to less stress on the participant.	
	It should be specified somewhere that set-up and verification should be done outside of the viewing area of the user.	
	While performing the dry run of the test, it was noted that participants might glance at the unit under test when reading the test description.	

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As-Shipped Condition	<p>We request that the EPA clarify the UUT configuration section to indicate that RCC units that are sold/shipped separately but cannot function apart from some other product or system. Devices that are not intended to function in the absence of other products or systems will not function if tested outside those products or systems and thus should not be tested without them.</p>	<p>EPA recognizes that there are solutions on the market which rely on connectivity to run an HVAC schedule. However, EPA does not have a way to evaluate the performance of these systems, including the reliability of their connectivity, and so will continue to require that Climate Controls continue to run schedules in the absence of connectivity. Note, however, that in the current release of the test method, it is clear that units which rely on remote interfaces for setting up and modifying schedules may be tested for that function through the RI and not through the Climate Control without an RI.</p> <p>For this version 1 specification, EPA intends to include criteria that ensure these products are capable of following the desired HVAC program in the absence of connectivity.</p>
UUT Configuration	<p>Since this is a timed test, EPA should specify a particular wrong date/time, such as January 1, 2010 at 6:00AM or 1 year, 6 months, and 5 days before today, to ensure a somewhat consistent result.</p>	<p>EPA agrees with this comment. In order to maintain testing consistency, in the draft 3 specification has been revised to require the administrator to set an incorrect date/time of 12:00 AM, January 1, 1999, prior to the start of Task 1.</p>
	<p>Lines 120-124: Manufacturers of multi-piece thermostats, such as where one device switches the relays on the HVAC system and a second device serves as the user interface, should be able to specify the location of the various pieces during the test, such as putting the user interface device on a table if it is designed to be a tabletop device.</p>	<p>EPA agrees with this comment and has revised draft 3 specification to specify UUT installation for ease of use testing shall be in accordance with product installation instructions.</p>
<b>Usability Tasks</b>		

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Task - Modify Program Schedule	<p>Is EPA trying to make people have to go into Saturday settings, set 9:00 AM to 11:00 PM at 68 degrees and then their sleep time to 11:00 PM and 65 degrees, and then set their awake time on Sunday to 6:00 AM? Seems like a lot of unnecessary steps for a test.... I would consider just having them set the 11:00 PM sleep time and temperature (65 degrees) and remove the 6:00 AM part for the purposes of this test.</p>	<p>EPA believes that the program modifications are reasonable and potentially represent a realistic use case.</p>
	<p>Does it matter which Morning/Day/Evening/Night periods are set for the Saturday schedule, or is any schedule that contains only those two times/setpoints sufficient to pass?</p>	<p>Success for this task is based on the resultant schedule only, the draft 3 specification sets <math>\pm 1^{\circ}\text{F}</math> tolerance for the programmed temperatures and a <math>\pm 10</math> min tolerance for programmed times.</p>
<b>Usability Task Parameters</b>		
General	<p>The EPA should do some preliminary testing with highly usable RCCs to come up with benchmark times for the various tasks, as the initial list was developed without any user testing, and it appeared to be too aggressive based on the stakeholder meeting test results for individuals who are presumably RCC experts.</p>	<p>EPA will be better informed after the round robin test has completed. At that time, adjustments to the ease of use task parameters, which affect scoring, may be considered.</p>
<b>Usability Script Document</b>		
Task 3 - ID Room Setpoint and Temp	<p>Change first sentence to read "When I say Begin, please read aloud the current room temperature and the set temperature, also called the active setpoint or <b>target temperature.</b>"</p>	<p>EPA agrees and has modified the test administrator script in the draft 3 specification accordingly.</p>
Task 3 - ID Room Setpoint and Temp	<p>Administrator should inform the panelist that the UUT has been placed in Cooling mode, as the unannounced change from Heating in Task 3 to Cooling in Task 4 may confuse some users.</p>	<p>In the draft 3 specification, the UUT is in heat mode for tasks 1 thru 3. For task 4 (turn on heat) the UUT is set to HVAC off and prior to the start of the task the administrator tells the user that the Climate Control is currently turned off.</p>
Task 4 - Activate/Cancel Away Mode	<p>Administrator should inform the panelist that the UUT has been placed in Heating mode, as the unannounced change from Cooling in Task 4 to Heating in Task 5 may confuse some users.</p>	
Task 5 - Modify Program Schedule	<p>The EPA should advise as to what the administrator should set for Task 5.</p>	<p>In the draft 3 specification, the administrator is instructed to set the UUT to heat mode, prior to the start of the task the administrator tells the user that the Climate Control is in Heat Mode.</p>

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Task 6 - ID Rate Tier	This should be removed.	Consistent with the removal of the prescriptive rate tier display criterion, the performance-based task to identify current rate tier has been removed from the draft 3 specification.
<b>Remote Interfaces Comments</b>		
<b>General</b>		
Allowing RIs into CC spec	Remote interfaces will save energy by providing a simple and convenient method of remotely turning their HVAC system heat cool settings up or down while at home or more importantly "Away" to reduce energy usage and cost of operation.	The Draft 3 Climate Controls specification now allows remote interfaces to be tested by a group of test participants as part of a qualified Climate Control to determine their ease-of-use.
Single User Action	The "single user action" is not appropriate for an RI, but the "Away" mode requirement should still exist.	Remote Interfaces are not eligible to earn the ENERGY STAR, they may, however, be included in Ease of Use path 3 as part of a Climate Control system with the performance-based approach. Prescriptive requirements, including single user action to set or cancel Away mode, do not apply to RIs.
3rd party RIs	Only 3rd Party RIs that are approved by the OEM should be listed.	Stakeholders have informed EPA that they are interested in protecting the user experience from poorly designed 3rd party apps or interfaces. EPA has elected to remain silent on this issue; however, EPA considers app qualification programs for the Android Market and the iPhone App Store as acceptable models for Residential Climate Control RI qualification.
	Open protocols should allow the code for 3rd party RIs to be written and certified with OEM controls. The 3rd party RI developer should be required to provide support (800#). The OEM and RI developer should own the responsibility of listing the climate controls or RIs that their respective products are certified with. The respective manufacturer's web site is the preferred method of identifying the approved RIs or Thermostats.	

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Appropriate minimum functionality	<ul style="list-style-type: none"> <li>• Display room (ambient) temperature</li> <li>• Display/change current setpoint temperature (temporary override until next program period)</li> <li>• Display/change current HVAC mode</li> <li>• Display/change current fan mode</li> <li>• View current long-term hold status and initiate/disable long-term hold</li> <li>• Initiate energy-saving “Away” mode</li> <li>• Display connectivity status (e.g., is RCC connected to Wi-Fi)</li> </ul> <p>System Modes, Heat/Cool set points, 7 day programming, Permanent Hold (same as Energy Savings Mode requirement now that ESM allows multiple single touches to enable).</p>	For the draft 3 specification, an RI may be evaluated in tandem with a Climate Control in the performance-based path 3, only. Thus, RI minimum functionality is defined only in the context of acceptable performance in ease of use testing.
Waiving requirements for streamlined path	<p>When a RI (PC or Cell-phone) is available for usability testing of the control itself should be waived.</p> <p>The streamlined qualification of the RCC through the performance-based path will allow for higher quality solution packages for the consumer with a better overall user experience.</p>	<p>In the draft 3 specification, Climate Controls that are submitted for performance-based ease of use testing may optionally be subject to an abbreviated test. The required tasks for usability reflect EPA's expectation that in the event the RI is unavailable, the Climate Control should still be a functional, easy to use, HVAC controller.</p> <p>EPA appreciates this comment and agrees that use of RIs is likely to generate enhanced overall ease of use.</p>
Labeling or Documentation	It should be sufficient for the OEM to provide a website URL that contains the most up-to-date information about supported and qualifying RIs.	In the Draft 3 specification, EPA has elected not to include criteria for Remote Interfaces on product packaging or instructions.
<b>External Connectivity</b>		
CC Market	By moving more of the functionality to an RI (see our response to Question 4), OEMs can reallocate costs from building a more functional user interface on the RCC itself to adding communications capabilities.	EPA agrees and notes that this was a key driver for the inclusion of Remote Interfaces in the Draft 3 specification.
<b>General</b>		

Topic	Draft 2/Usability Metric/RI Discussion Document Version 1.0 Climate Controls Comments	EPA Response/Draft 3 Version 1.0 Climate Controls Specification Proposal
Recertification	A RCC or an RI should not require re-certification with every RI software release	For the draft 3 specification, EPA does not set any criteria for RI revision control, versioning or re-testing. The Third-Party verification program will help periodically ensure compliance with the Climate Controls specification.