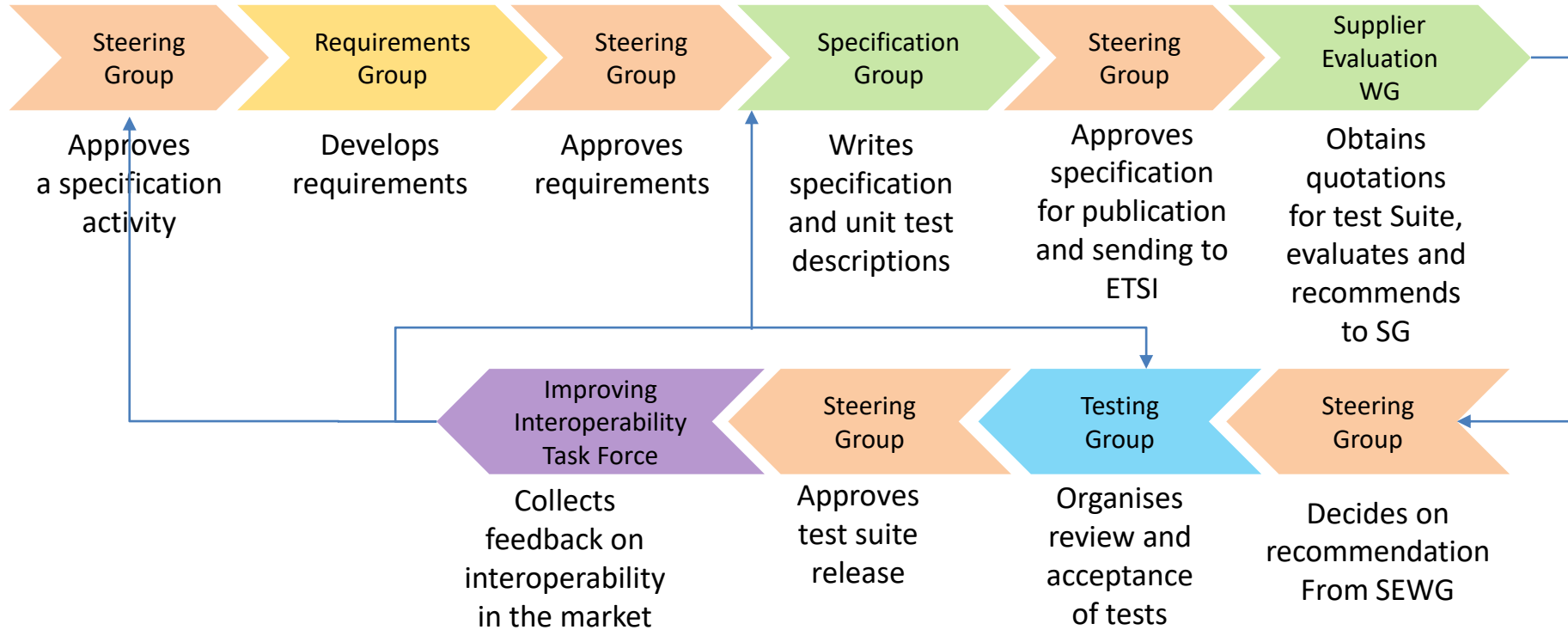




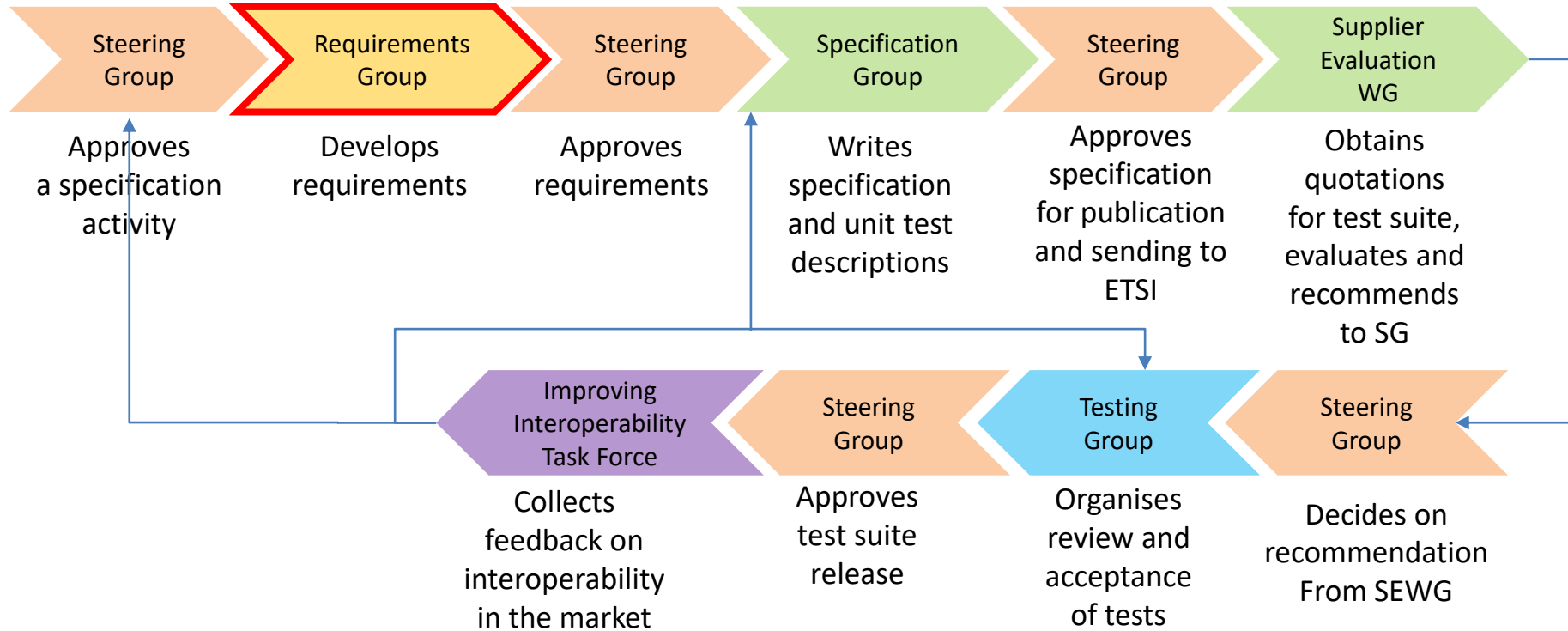
# Growing HbbTV's value: The latest on our specifications and activities



# HbbTV Specification Workflow

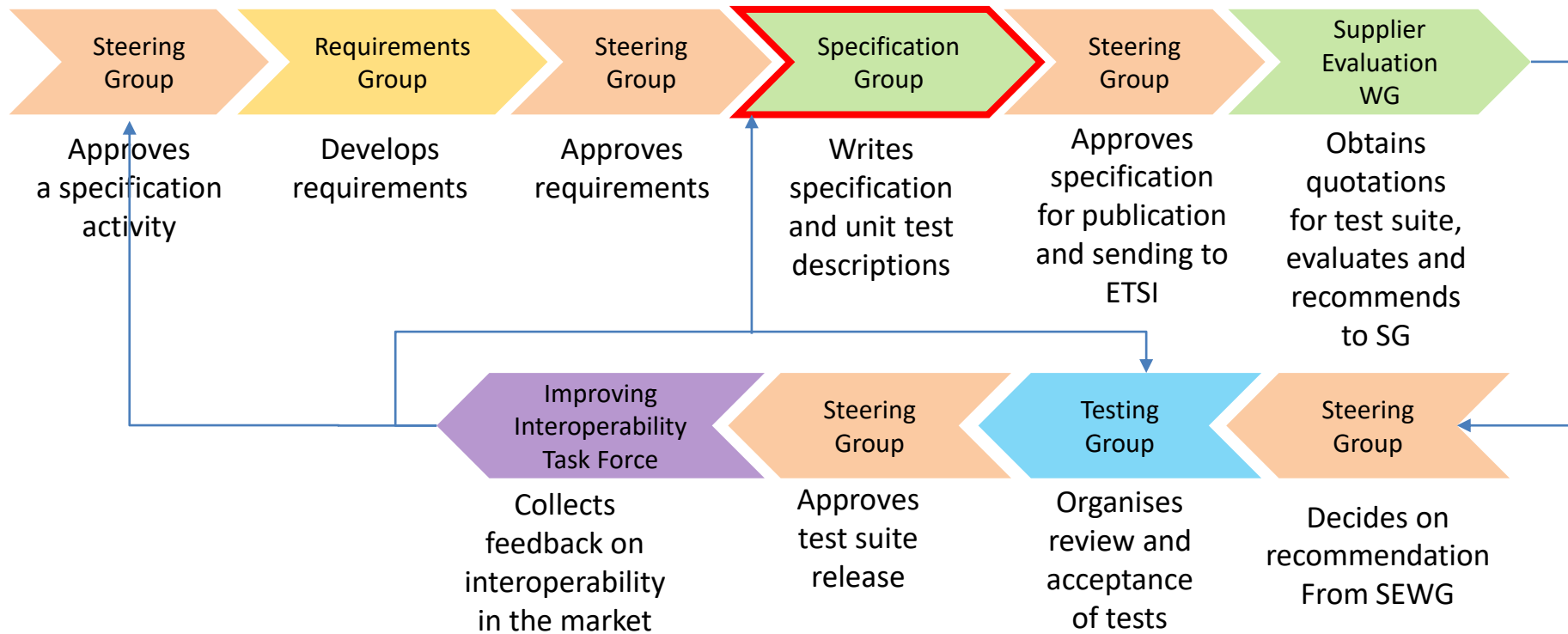


# HbbTV Specification Workflow



- Recently
  - Worked with DVB on requirements for targeted advertising
  - Considered some possible requirements for a future HbbTV spec which led to ....
  - Working on HbbTV roadmap just mentioned by Vincent
- Looking forwards
  - Start work on the roadmap when appropriate

# HbbTV Specification Workflow



- HbbTV 2.0.2
  - Adds optional HDR video (HDR10, HLG), HFR video, Next Generation Audio (AC-4, MPEG-H)
  - Fixes bugs, removes ambiguities, ...
- Errata #3 to HbbTV 2.0.1
  - Identical bug fixes to HbbTV 2.0.2
- 2.0.2 & 2.0.1+errata #3 *are almost identical* if a TV / STB doesn't support HDR, HFR or NGA with HbbTV

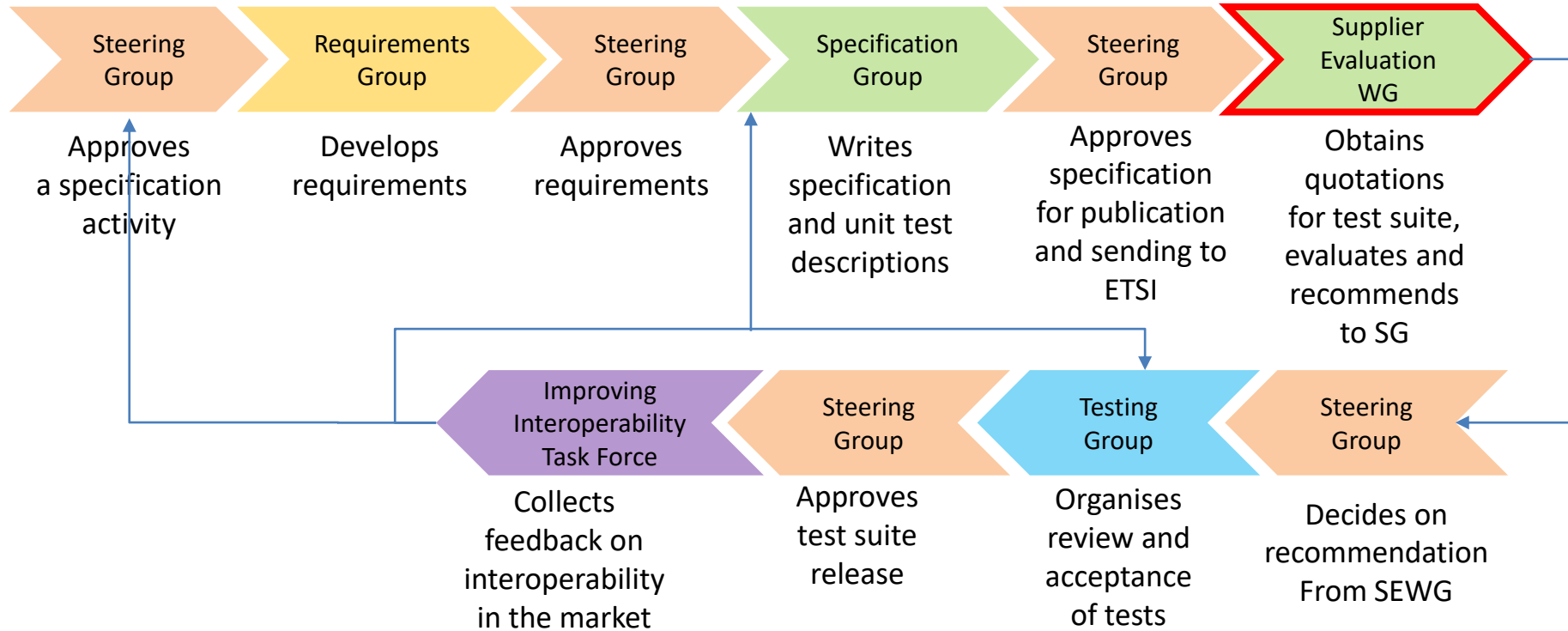


- Targeted advertising
  - Will be an "independent" (stand-alone) spec like OpApps
    - Could perhaps be integrated into the core HbbTV spec in the future
  - Some key issues
    1. Preloading an ad into RAM so it can be played without any glitches, "buffering" ...
    2. How to cleanly & quickly transition from broadcast to an ad & what is "good enough"
    3. How to cleanly & quickly transition from an ad back to broadcast & what is "good enough"
    4. How to ensure that a 30s ad from RAM can replace a 30s broadcast ad without overlapping ads (or program) on either side
    5. How much detail is useful to expose different device capabilities
    6. How to balance tightening requirements around what we have vs adding something new with tighter requirements from day one
  - Today
    - Have decided to use W3C Media Source Extensions to address #1
    - Working on the other issues
  - Spec is merely one step on a journey, HbbTV targeted advertising needs cooperation between broadcasters and manufacturers otherwise it won't happen

- OpApps
  - Bug fixes will be published at some point
    - To be decided if this will be errata or a new version of the spec
  - 26 fixes agreed
  - 7 fixes still under consideration
- HbbTV 2.0.1/2.0.2
  - 33 fixes agreed
  - 10 fixes still under consideration
- Application discovery over broadband (ADB) phase 2
  - Will enable HbbTV services to reach consumers on TVs connected to broadcast via a STB & HDMI
    - You may remember the broadcaster problem reaching IPTV STB users in Spain
  - Initially based on video and audio watermarking solution from ATSC 3.0
    - Organised to permit others to be added

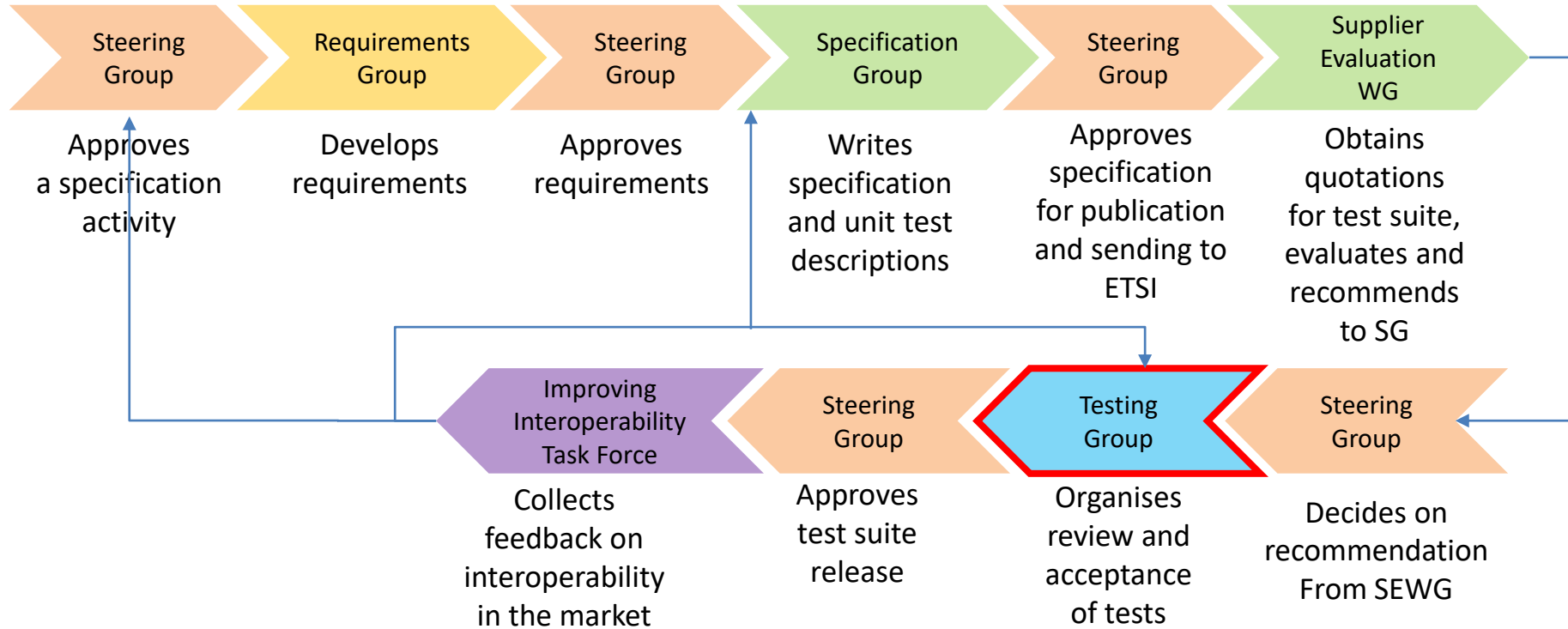


# HbbTV Specification Workflow



- SEWG is responsible for obtaining and evaluating quotations from suppliers
  - A role that's very unusual in organisations like HbbTV
  - Absolutely critical - HbbTV has > 800K € budgeted for tests & interop FY 2018/9
  - SEWG makes recommendation to Steering Group who make the decision
- Recently worked on ordering test cases for
  - Op App
  - HbbTV 2.0.2 HDR video / HFR video / Next Generation Audio
  - Lower priority HbbTV 2.0.1/2 test cases (synchronisation, subtitles)
- Also worked on commercial side of paid Test Material Review services
- Looking forwards – more of the same for new specifications, e.g. TA

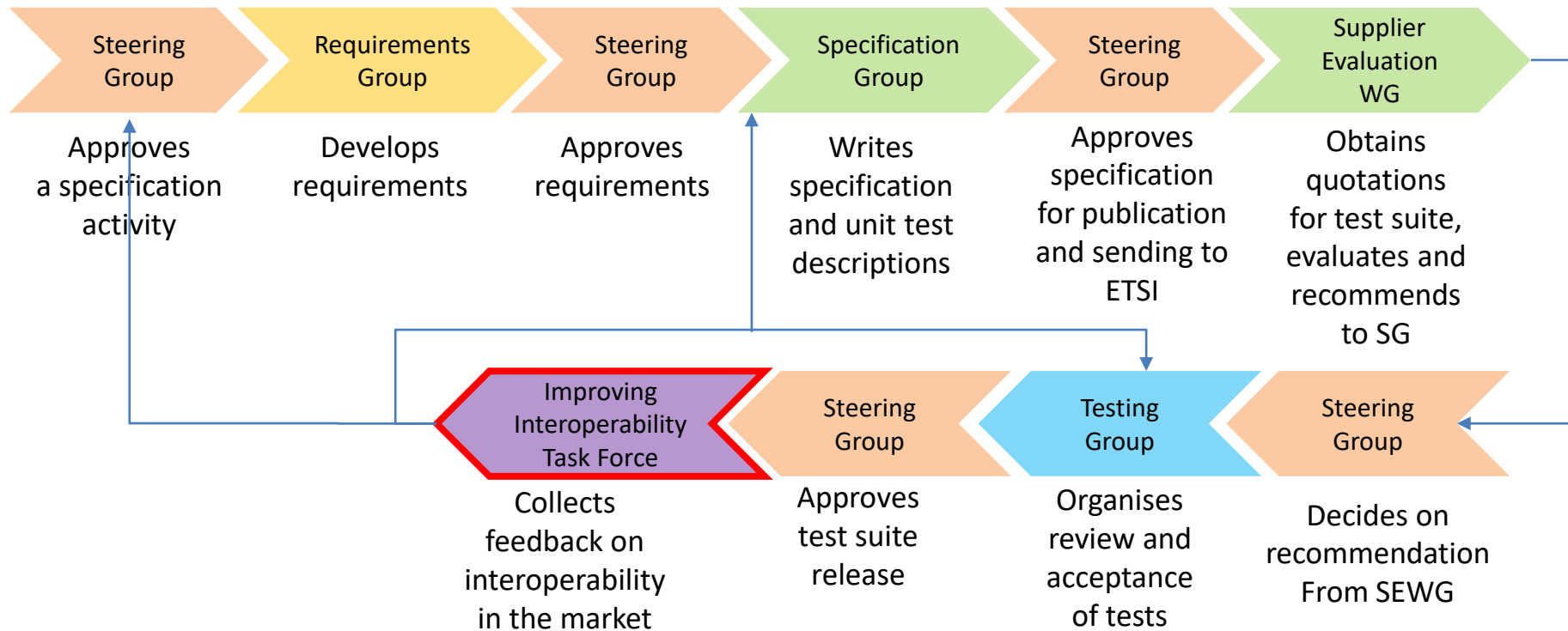
# HbbTV Specification Workflow



- 3 test suite releases during 2018
  - Now named 2018-1, 2018-2 & 2018-3
    - Version numbers are too confusing
  - Each release has tests for all spec versions
    - >600 tests apply to all HbbTV spec versions
    - >900 tests apply to HbbTV 1.5 and 2.0.1/2
  - Finally, at long last, almost cleared the backlog of test cases for HbbTV 2.0(.0) features
- Continuing maintenance activity repairing & re-approving tests where problems are found
  - 2018-3 contains 2146 tests, of which 1644 are approved
  - 104 tests repaired and re-approved in total
    - 82 were challenged before 2018-2 (backlog) and now repaired and
    - 22 were approved in 2018-2 and challenged and repaired and re-approved again.
  - 76 tests were removed from the approved list due to being challenged
- Started reviewing new tests for OpApps, HDR, HFR, NGA
  - OpApps: so far about 85 of 300 are reviewed
  - HDR, HFR, NGA: nearly 180

- 2019-1 and 2019-2 releases
  - More repair and re-review cycles
    - Should decrease over time
  - Approve OpApp and HDR/HFR/NGA tests
    - Approving a test needs
      - Review
      - Running the test on an implementation
    - More volunteers needed to review OpApp tests (or to pay for an expert to do this)
    - More volunteers needed to run all tests on implementations
  - Process lower priority HbbTV 2.0.1/2 tests
    - 66 more tests for inter-device sync, multi-stream sync
    - 24 more tests for subtitles
    - Will require review & running on implementations

# HbbTV Specification Workflow



- HbbTV – DASH – DRM reference app
  - Existence proof showing use of HbbTV with DASH and DRM to deliver VoD and live services (some people said it didn't work)
    - Tested on >20 actual HbbTV receivers going back to 2013
      - Works fine on most of them
    - Open source license – re-use as-is, copy bits, do things the same way, ....
    - Available on github at <https://github.com/HbbTV-Association/ReferenceApplication>
- DASH content validator
  - Extensions to DASH-IF validator to support HbbTV 1.5 DASH and DVB-DASH as used in HbbTV 2.0
    - Now integrated in DASH-IF validator - <https://conformance.dashif.org>
      - HbbTV "mode" selected based on contents of DASH MPD
- More details in Bob Campbell's presentation yesterday
  - Also [here](#) for the reference app

- Collect feedback on inter-operability problems
  - Issues which occur on devices from *multiple* suppliers
    - Issues with devices from a single supplier need to be raised directly
- Review, triage, pass to relevant group
  - Specification Group, Testing Group, Steering Group, ...
- Monitor usage of HbbTV-DASH-DRM reference app & DASH validator
  - See if they're used enough to justify further extensions
    - Validator support for new profile of DVB-DASH used in HbbTV 2.0.2
    - Multi-period DASH in the reference app



- Consultants SwissMediaPartners commissioned to do a report - draft currently available to HbbTV members
- Some interesting points
  - GDPR applies to service providers, the forthcoming ePrivacy directive would apply to devices (but is subject to continuing delay)
  - Consultants like to emphasise consent as the "lawful basis" for information processing more than other (less clear) GDPR reasons such as "legitimate interest" or "compliance with legal obligation"
    - GDPR's "legitimate interest" may cover apps making broadband connections without asking the user to some extent
  - Many (German) broadcasters already include some form of provision for consent
  - Many TV manufacturers also include some form consent as part of their device setup UIs
  - The user choosing to connect their TV to the internet could be seen as an important part of consent – or may not be
  - It's possible today to make HbbTV services that don't process any personal information
- The whole area is very uncertain
  - Seems impossible to know what is needed for proper GDPR compliance right now
- HbbTV will have a continuing privacy activity going forwards
- Even if your lawyer says something is legal, think about what would happen if your app / service appeared on the front page of a national newspaper on a quiet news day.
  - How much would your organisation be damaged?

- If your company is an HbbTV member, please come & participate in the working groups and task forces
- If your company is not an HbbTV member & sees something interesting, please join and then participate