

# ETV on the way to standardisation

**Richard Gould**  
**Technical Advisor**

**Environment Agency, England and Wales**

# Outline

- Introduction
- Objectives of any verification scheme
- The application of standards
- Some examples of ETV and standards co-evolution
- How we could apply standards to an ETV scheme
- How we could develop the standards
- Recommendations

# The speaker

- Technical Advisor, Environment Agency
- Measuring pollution
- Quality Assurance
- Testing schemes
- IPPC
- Standards
  - *Application*
  - *Development*
  - *Guidance*
  - *Training*
  - *Auditing*
- CEN TC 264 (Air Quality)
  - *WG4, WG9, WG16, WG9*
- ISO TC 146 (Air Quality)

# Why use standards?

---



Effective standards make  
our work easier to do

# Objectives of any ETV scheme



- Verifying claims
- Demonstrating performance
- Confidence in technologies
- Confidence in testing
- *Like-for-like* comparisons
- Mutual recognition
- *One-test, universal acceptance*
- Bond with other types of related scheme

# Certification and verification

- Verification
  - *Testing to specified criteria*
- Criteria
  - *Manufacturer's claims*
  - *A sector, national or international standard*
  - *Testing to part of a standard*
- Certification
  - *Testing to a standard - verification*
  - *Manufacturing consistency,*
  - *Design control*
  - *Surveillance*
- Product Certification (EN 45011)

# Verification versus Certification?

- Both are strongly related
- Both start with a claim
- Both rely on testing
- We can have both
  - *Modular approach*
- Standards can provide a framework

# What do we mean by a standard?

- A document
- Instructions
- Protocols
- Methods
  - *Recipes*
- Defined procedures
- Supporting information

# Why use standards?

- A framework for claims
  - *Types of claim*
  - *Benchmarks if people want them*
  - *Buyers, investors, regulators*
  - *Performance criteria*
- A framework for testing
  - *Like-for-like comparisons*
  - *Quality assurance of testing*
- A framework for mutual recognition
  - *Like-for-like comparisons of technologies*
  - *Universal acceptance of testing*
- **Harmonisation**

# No standards – the risks

- Lack of structure and direction
- Diverse ranges of claims
- Diverse approaches to testing
- Variations in quality of testing
- Can make comparisons difficult
- Lack of harmony
- Resistance to recognition
- Multiple tests to multiple and varying criteria
- Deters manufacturers
- Deters investors

# Existing testing schemes

- Air emissions monitoring
- Ambient air monitoring
- Effluent monitoring
- Solar panels – water heating
- Solar panels - photovoltaic
- Wind turbines
- Noise monitors
- Some schemes not as developed as others
  - *Variability*
  - *Lack of mutual recognition*

# Examples

- Air pollution monitoring
- Solar panels
- Wind turbines

# Air pollution monitoring



# The Golden Stack Award



# Evolution over thirty years

- No verification, no standards
- Disparate verification
- National schemes and structures
- Lack of mutual recognition
- International cooperation
  - *Driven by largely by manufacturers*
- National alignments
- International standards
- Consistency and modularity
- Mutual recognition

# Air pollution monitoring

prEN 15267-1	Framework for testing (verification) and certification (approval)
prEN 15267-2	Quality management system for AMS design and manufacturing control (certification)
EN 15267-3	Stack-AMS performance specifications and test procedures (verification)
EN 14211 EN 14212 EN 14625 EN 14626	Ambient-AMS performance specifications and test procedures

# Solar panels



# Photovoltaic panels



# Solar panels – example standards

ISO 9459-1	Solar water-heating systems: Performance rating procedure using indoor test methods
ISO 9459-2	Solar water-heating systems: Outdoor test methods
EN 12975-1	Thermal solar-systems and components - General Requirements
EN 12975-2	Thermal solar-systems and components - Test methods
EN 12976-1	Factory-made thermal solar-systems and components: General requirements
EN 12976-2	Factory-made thermal solar-systems and components: Test methods

# Wind turbines



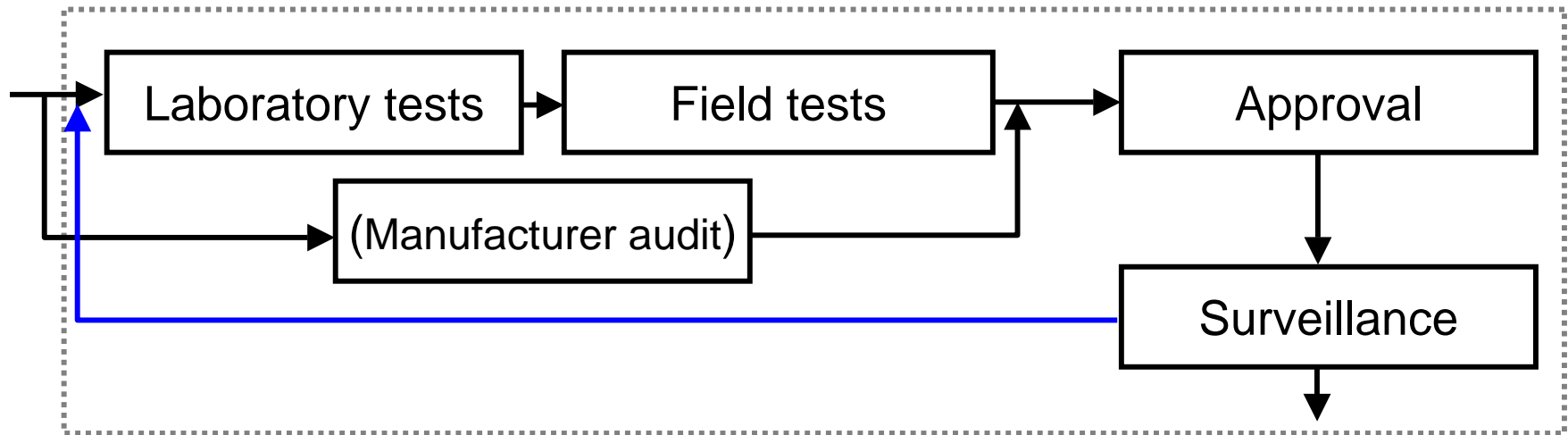
# Wind turbines – example standards



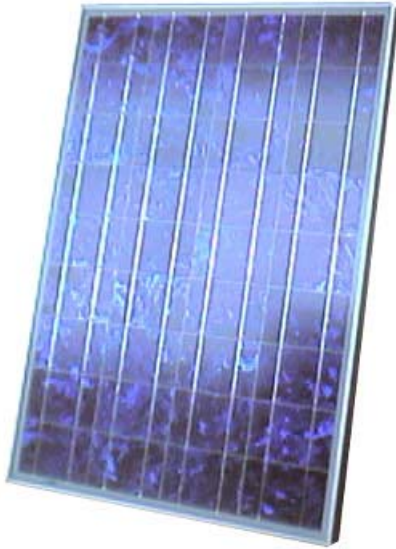
IEC 61400-1	Wind Turbine Safety and Design
IEC 61400-2	Small Wind Turbine Safety
IEC 61400-12	Power Performance
IEC 61400-11	Noise Measurement
IEC 61400-21	Power Quality
IEC 61400-23	Blade Structural Testing
IEC 61400-22	Wind Turbine Certification

# Testing and approval

Typical approaches



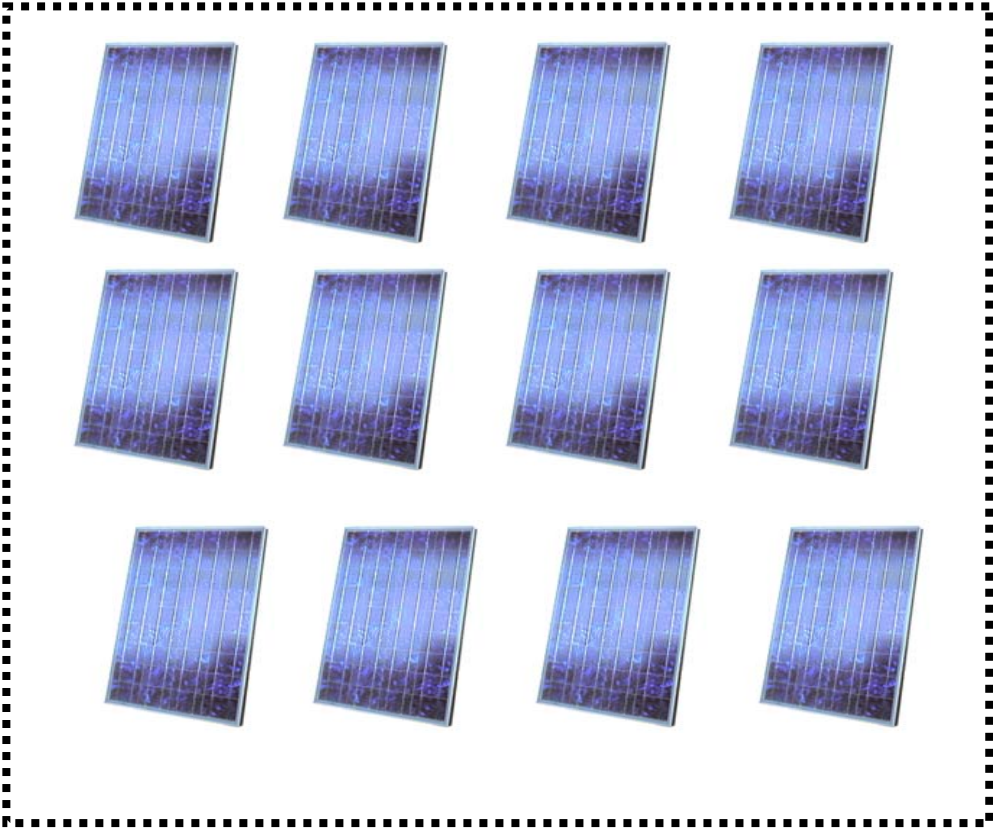
# Proof of performance – Stage 1



Testing



# Approval – Stage 2



**Product certification  
EN 45011**

Assess  
Manufacturing  
processes



Official  
Approval



# Driving forces for standards

- Regulation
  - *Does not play as big a part as expected*
  - *But regulation can bind and strengthen standards*
- Customers and manufacturers
  - *Common ground*
  - *Accepted performance criteria*
  - *Mutual recognition*
- Test laboratories
  - *Need to know the rules*
  - *Quality assurance*
  - *Mutual recognition*

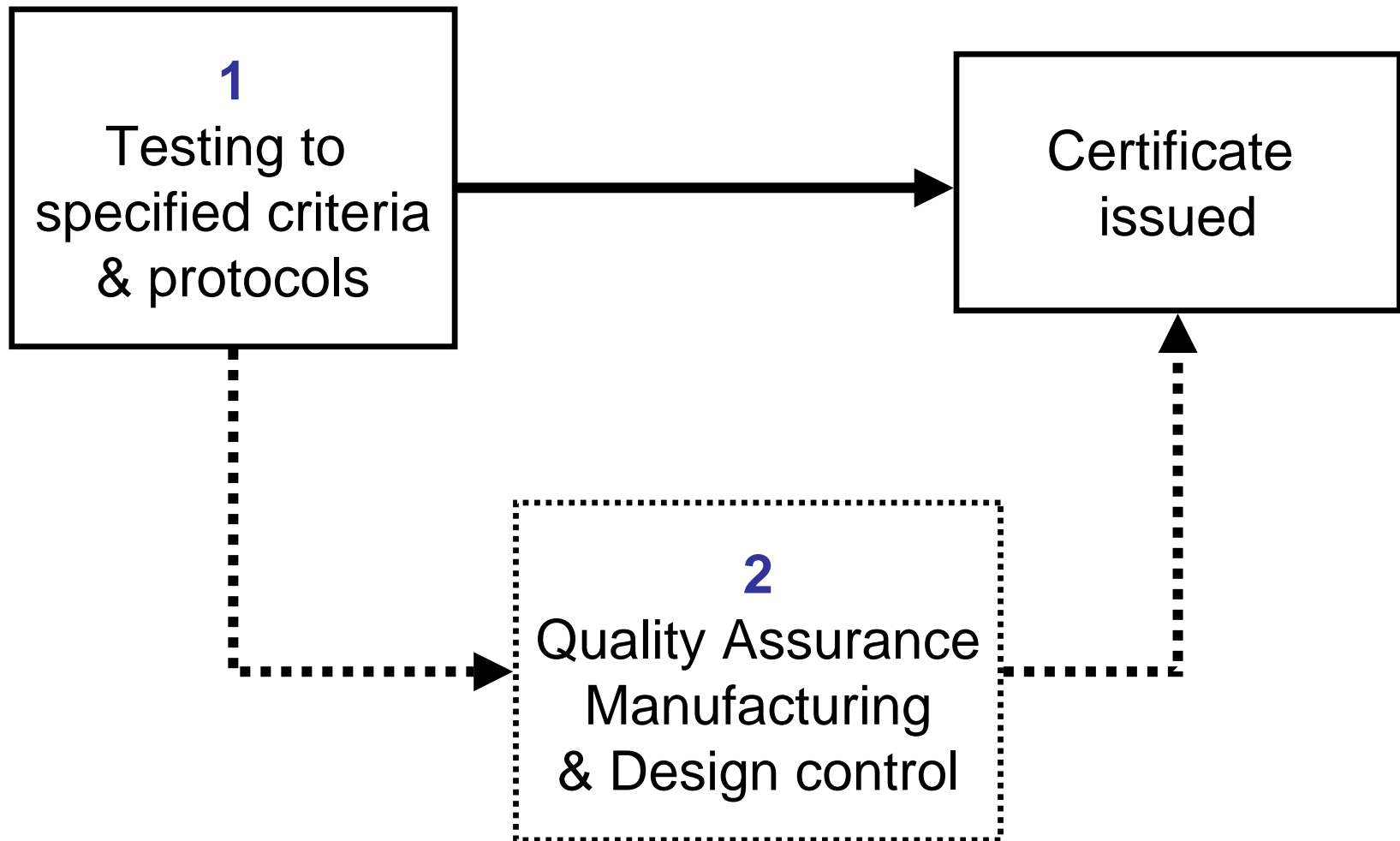
# Problems – all schemes

- Common criteria
  - *Often no mutual recognition*
  - *Repeated testing*
- Trade barriers as well as trade catalysts
- Lack of a framework - Fragmentation
- Standards not always present or applicable
- Technology-based standards are restrictive
  - *make standards performance-based*
  - *give targets for performance, not means of achievement*
- Standards may also pose barriers to new entrants
- BUT...there are solutions to all these problems
- Effective standards
- ETV Solution
  - *Flexible, modular ETV framework with aligned sectors*

# Solution – ETV scheme

- Framework for a modular approach
- Testing to flexible criteria with common elements
- Partial and progressive verification to standards and then certification, if desired
- Credible verification for technologies without standards
  - *Protocols*
- Provisions for mutual recognition
- Bind and strengthen all schemes
  - *Verification and certification*

# Synergies



# Applying standards

- How do we apply them?
- How do we develop them?

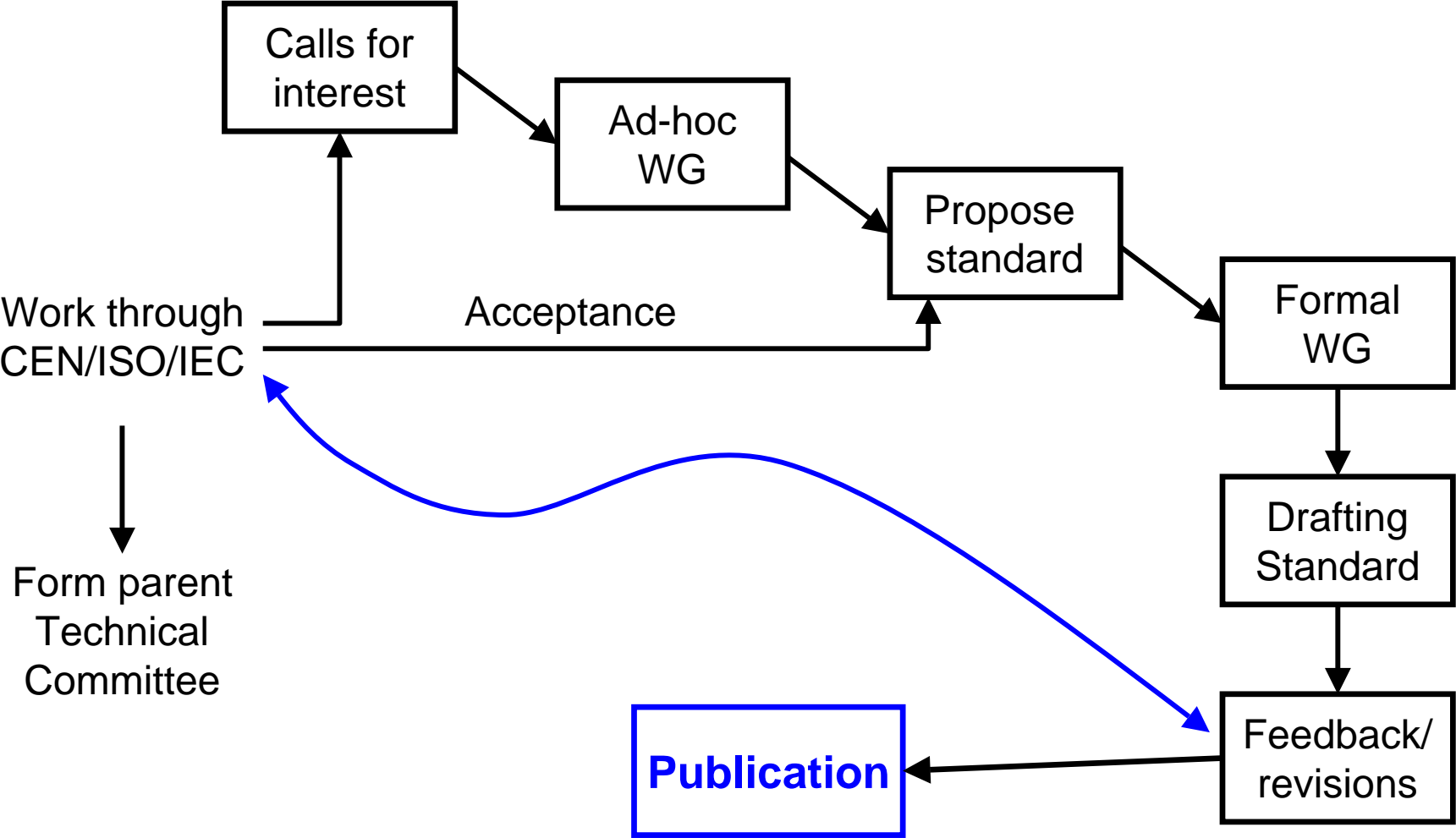
# How do we apply standards?

- Flexible protocols for test programmes
- Flexible protocols for framing claims
- Make use of existing standards
- Set benchmarks
- Quality assurance of testing
- Frameworks for mutual recognition
- Strengthen and bind existing scheme

# How do we develop them?

- National and International standards groups
  - *National, CEN, ISO, IEC*
- Already happening (The Track Effect)
  - *CWA32 – Contaminated land/groundwater remediation*
  - *CWA42 – Air-emissions control-technologies*
- Specialist sector groups
  - *Working groups*
  - *Like-minded people work together*
  - *Ranges of experiences*
- Start a CEN Technical Committee
  - *Links to other CEN/ISO/IEC TCs*
  - *The Vienna Agreement (CEN/ISO)*

# Work process



# Types of standard

- Standards
  - *Binding requirements*
- Technical Specifications
  - *Lower consensus required*
  - *Can evolve into a Standard*
- Technical Reports/Guides
  - *Supporting guidance*
- CEN Workshop Agreements
  - *A proto-standard*
  - *Can evolve into a Standard*

# ETV series of standards?

- Related aims
  - *A series of standards/guidelines*
- Structure and framework of an ETV scheme
  - *Provisions for mutual recognition*
- Protocols for claims
  - *Setting performance specifications*
- Protocols for designing test programmes
- Protocols for testing
  - *Quality assurance*

# Structure of a standard

- CEN/ISO make this easy
  - *There are rules and templates*
- Introduction
- Scope
- References
- Body of standard
  - *Programmes, protocols, instructions, testing*
  - *Data handling*
  - *Reporting requirements*
- Supporting information
  - *Annexes*
  - *Examples*

# Recommendations

- Use standards and protocols if available
- Write new ones if standards are not available
- Make standards performance-based, not technology-based
- Provide flexibility within a modular approach
  - *From a simple verification to certification if needed*
- Involve all stakeholders
- Strengthen through legislation
  - *Mutual recognition*
- Practicality, not academic exercises
  - *Keep costs down for manufacturers*
- Cooperate internationally
  - *Mutual recognition*
  - *CEN, ISO, and IEC*
- Make standards work for an ETV scheme, and not the other way round