Sustainability for National Road Administrations - SUNRA
Clare Harmer and Chris Sowerby
12th February 2014
## Contents

1. Overview of SUNRA
2. Sustainability in NRAs
3. Framework 1: defining sustainability
4. Framework 2: sustainability metrics
5. Framework 3: the project framework
6. Dissemination
Overview of SUNRA

SUNRA has worked to develop a common understanding and means of measuring, benchmarking and improving sustainability performance of NRAs in Europe.

Delivered by a partnership between TRL, VTI, CH2M HILL, TNO and DTU.

Three primary objectives:
- To provide a common way of defining sustainability within the context of European NRAs.
- To identify how to measure sustainable development at a strategic level and integrate sustainable decision making into key intervention points.
- To develop a sustainability rating system framework that will enable NRAs to improve performance within the context of building and managing roads.
Three interconnected frameworks

Framework 1: helps NRAs define sustainability considerations at a strategic level, considering the level of influence they have; defining a commitment; and an implementation approach.

Framework 2: is used to identify strategic sustainability metrics and performance levels applicable to organisational, programme and project level.

Framework 3: provides a project level tool for scoping sustainability topics, selecting indicators, setting appropriate targets and recording results.
Defining sustainability

- Numerous definitions of sustainability, sustainable development and sustainable transport have been proposed in policy and academic literature.
- However, there is ongoing debate on how valid any of the existing definitions actually are and how helpful it is to try to define ‘sustainable transport’ in the first place.
- NRAs are not identical across countries in terms of their responsibilities, organisational structures or available delivery methods, not to mention their goals and objectives.
- Hence, NRAs need guidance on how to define sustainability that is helpful in their national context.
NRA approaches to sustainability

- Methodology: Survey of 22 European NRAs, via a questionnaire
- Purpose: To assess current practice in sustainability
- Result: 17 NRAs responded, with a reasonable representation of European countries in terms of geography, size and road network maturity
- Key findings: almost all have specific ambitions with respect to sustainability though differ greatly in the extent to which sustainability is implemented and how this is done
NRA approaches to sustainability

- Methodology: Literature review and stakeholder workshop
- Purpose: To identify sustainability metrics
- Result: 270 metrics currently being measured by NRAs, 52 by more than one NRA, combination of quantitative and qualitative measures
- Outcome: 14 key sustainability topic areas identified, and set of priority metrics defined
A systemised framework

Sustainable Development  Green Space  Hospitals  Energy  Other infrastructure
Housing  Other buildings  Schools  Transport infrastructure  Consumer goods  etc.

NRA – Build and Manage Roads

Framework 1
1) Interpretation of sustainability in the context of transport and road systems

- Economic
  Equitable good jobs, fair wages, fair trade, economic development

- Social
  Quality of life: working conditions, health, safety, education, community, culture, justice

- Environmental
  Development within environmental limits, resource efficiency, environmental impact

2) NRA review of impact and influence over direct and indirect contribution to sustainability

3/4) Common definition of ‘sustainable development’ in the context of an NRA with Strategic Commitment

Framework 2
Matrix of strategic metrics at board, programme and project level
Four performance levels based on the level of integration of sustainability monitoring and performance improvement

Framework 3
Project level 1) scoping, 2) setting targets, indicators and 3) performance measurement and rating
Planning  Design  Construction  Maintenance  Decommission

Practical evidence based intervention  Project delivery
Framework 1: Defining sustainability

- Provides a practical **four-step** approach to help NRAs create and apply an appropriate definition of sustainability which can then frame its subsequent activities.
- Not appropriate to have a single definition of sustainability that all NRAs are expected to adopt.
- It suggests key elements to consider and proposes specific outputs to be delivered from each step.
Framework 1: Defining sustainability

Step 1: Interpretation of sustainability in the context of transport and road systems

Step 2: Review of impact, influence and responsibility

Step 3: Crafting a strategic commitment

Step 4: Implementing the commitment
Framework 2: Sustainability metrics

- Matrix of sustainability performance levels for managing and monitoring requirements at project, programme and board level

- Supported by example metrics at each performance and management level for 24 sustainability topics

- Contains four levels of sustainable development, with one being the lowest and four being the highest
## Framework 2: Sustainability metrics

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment by the board to sustainability. Measuring and monitoring performance based on the NRAs current priority topics.</td>
<td>Developing a sustainability strategy and relevant policies. Undertaking wider ranging measuring and monitoring covering additional sustainability topics and are starting to see improvements in performance, in relation to the NRAs priority topics.</td>
<td>Has a sustainability strategy and policies in place. Undertaking wider ranging measurement and monitoring, including topics that demonstrate the NRAs wider contribution to sustainable transport. Seeing improvements in performance, in relation to the NRAs priority topics.</td>
<td>Has a well embedded sustainability strategy and policies. Undertaking comprehensive measurement and monitoring of wide range of topics, to include those that demonstrate the NRAs wider contribution to sustainable development. Improving performance year on year for a wide range of topics, including those introduced at both level 3 and 4.</td>
</tr>
</tbody>
</table>
Framework 2: Sustainability metrics

- Accessibility
- Air quality
- Climate change adaptation
- CO2 emissions
- Cultural heritage
- Economic viability
- Ecosystems
- Equity/equal mobility
- Global partnership
- Good governance
- Innovation
- Job creation and training
- Modal split
- Noise
- Prosperity
- Public health
- Renewable energy
- Resource consumption and waste
- Road condition
- Safety
- Security
- System efficiency
- User satisfaction
- Water quality
Framework 3: the SUNRA Project Framework

- Enables an NRA to define and record sustainability performance of a road project, drawing on existing processes and records rather than adding additional administrative burden

- Provides a single record of sustainability performance

- Provides a comprehensive range of sustainability issues, potential indicators and target considerations with the flexibility to include or exclude from the framework

- Allows tailored and scalable sustainability assessment appropriate to NRA and project specific needs

- NRAs can use the Framework to set the performance standard they wish projects to be targeted and measured by
What is the SUNRA Project Framework?

- The SUNRA Project Framework is a Microsoft Excel based tool that provides a flexible framework for NRAs to assess the sustainability performance of their projects.

- It contains 26 sustainability topics which aid the NRA in scoping relevant sustainability aspects to assess their projects against.

- It allows NRAs to set targets and indicators against the scoped sustainability aspects.

- It provides a common framework for recording performance.
The SUNRA project framework scope

<table>
<thead>
<tr>
<th>Scope of the SUNRA framework</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️ Common flexible framework – allows users to set scope</td>
<td></td>
</tr>
<tr>
<td>✔️ Suggested considerations for setting targets and possible indicators</td>
<td></td>
</tr>
<tr>
<td>✔️ Scalable to NRA or project requirements</td>
<td></td>
</tr>
<tr>
<td>✔️ Project focused tool covering whole life impacts considering how they are managed</td>
<td></td>
</tr>
<tr>
<td>✔️ during design, construction and maintenance</td>
<td></td>
</tr>
<tr>
<td>✗ Scoring system (many others exist)</td>
<td></td>
</tr>
<tr>
<td>✗ Pre-defined mandatory indicators and targets</td>
<td></td>
</tr>
<tr>
<td>✗ Verification standard or award</td>
<td></td>
</tr>
</tbody>
</table>
Not another rating system...

- Many tools provide scoring based assessment frameworks with fixed questions and targets

- Existing rating systems:
  - Australia IS Rating System
  - BE2ST-in-Highways
  - BREEAM Infrastructure
  - CEEQUAL
  - Envision
  - FHWA INVEST
  - Green Guide for Roads
  - GreenLITES
  - GreenPave
  - GreenRoads
  - I-LAST
  - Ireland NRA System
  - SHMT
  - STARS
  - VicRoads INVEST

- SUNRA Project Framework: a flexible framework to help identify relevant sustainability topics and appropriate targets/ indicators
Who is the tool intended for?

- The SUNRA Project Framework is intended to be used by the client organisation and their delivery partners – designers and contractors

- Scoping is undertaken by the NRA based on its priorities and policies (identified using Framework 1)

- For each of the sustainability topic aspects scoped into the Framework, targets and indicators need to be identified

- To help ensure that targets are met, a responsible ‘actor’ must be assigned for each target/ indicator
When is the tool intended to be used?

- The scoping process should be completed early in the project planning phase to allow all relevant issues to be properly considered.

- The framework considers indicators relevant throughout the asset lifecycle from on-site construction and maintenance activities (including end-of-life for materials) to operating and using the road.
The SUNRA framework process

**Scoping**
- Users follow a series of scoping questions to consider whether the key aspects of each of the 26 sustainability topics included in the framework should be assessed.

**Setting targets**
- Users define performance targets for each key issue.
- To help ensure that targets are met, a responsible ‘actor’ is assigned for each target/indicator.

**Identifying indicators**
- For each aspect scoped into the framework, a suitable indicator is suggested.
- Users are free to use suggested indicators or other relevant NRA/project specific indicator.

**Recording performance**
- Performance is recorded against each target.
The SUNRA tool

The following section provides a ‘walk through’ guide to the SUNRA tool

- Overview of tool structure
- Home page
- Sustainability topic pages
  - Topic description
  - Scoping questions
  - Setting targets and choosing indicators
  - Recording performance
- Tool summary page
The SUNRA tool structure

- **Home page** - used to navigate through topic pages and track progress on completing inputs
- **Topic pages** - used to answer scoping questions, record indicators, targets and performance
- **Summary page** - provides overview of input completion, % of scoping, and performance summary as % achieved
SUNRA Project Framework

About

The Sustainability - National Road Administrations (SUNRA) Project Framework provides a project level tool for scoping project level sustainability topics, setting appropriate targets, selecting indicators and recording results. The purpose of SUNRA is to drive change and an improvement in sustainability performance of national road development and management across Europe.

The tool can be used to set sustainability objectives, targets and indicators and assign responsibility to the client, designer or contractor organisations throughout the project lifecycle, during pre-design, design, construction.

The tool should be used to consider sustainability impacts that occur over the whole life of an asset, including: construction, operation, maintenance and decommissioning/replacement.

Project details and user details

Project name: 
Tool version: 
Project start date: 
Date of last update: 
User reference, e.g. if multiple versions of the Framework are completed

Tool users:

<table>
<thead>
<tr>
<th>Name</th>
<th>Initials</th>
<th>Organisation name</th>
<th>Organisation type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sustainability topics

The Framework contains 36 sustainability topics. 20 of these are impact based and can be accessed from the matrix of blue boxes below. For each of these topics scoping questions should be answered, targets set for aspects scoped into the Framework with appropriate indicators and performance recorded.

Six of the 36 topics differ from the others in not being attributable to specific sustainability topics but instead to planning procedures or organisational issues. These six topics are grouped together in the Framework under the heading 'Procedural topics' and can be accessed from the bottom right of the matrix below. Only the scoping stage is completed for these topics.

<table>
<thead>
<tr>
<th>Accessibility (to workplaces and other local services)</th>
<th>Air quality</th>
<th>Climate change adaptation</th>
<th>Climate change mitigation</th>
<th>Cultural heritage</th>
<th>Economy (local/ regional)</th>
<th>Energy efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equality (generation, gender and other social)</td>
<td>Landscape and ecosystem health</td>
<td>Light pollution</td>
<td>Livability of residential areas</td>
<td>Noise and vibration</td>
<td>Resource efficiency</td>
<td>Safety and security</td>
</tr>
<tr>
<td>Soil quality</td>
<td>Stakeholder involvement</td>
<td>Sustainability awareness of staff</td>
<td>Sustainable transport modes (facilitating use of)</td>
<td>Waste</td>
<td>Water resources and quality</td>
<td>Procedural topics</td>
</tr>
</tbody>
</table>

Outputs

The Framework will provide summary tables for all aspects scoped in where targets and indicators have been set. Click on the links below to access the summary tables for each 'responsible actor'.

Use the update buttons on each page to refresh the tables (tables are not automatically updated).
The SUNRA Project Framework is a three stage process for NRAs (or other clients), their designers and contractors to follow to consider sustainability, measure and record performance on road projects.

This basic user guide provides information on how to use this framework. This is supported by screenshots to the right of the page (click to expand - note to close click away from the screenshot then click back on the image). Please refer to the Implementation Guide for advice to NRAs on how to implement the SUNRA Framework within their organisations.

Step 1: Scoping

It is intended that the scoping stage is undertaken by the NRA based on its priorities and policies. This could be done once and applied to all projects and be subject to periodic review.

The Project Framework includes 26 topics, jointly intended to represent a variety of aspects of sustainability, for which a number of key aspects have been described. Scoping is based on sustainability considerations that cover all lifecycle stages, including construction and maintenance, as well as operating the road. For all topics, three standard scoring questions are included covering EU and national policy or legislation, NRA policy, and site-specific issues. Each topic is equipped with a scoring question which will guide the user whether to include the aspect in the assessment or not. Within a specific topic, different aspects may thus be either scoped in or out.

The scoping step enables NRAs to set the overall scope of sustainability topics to be considered to the specific needs of their project, organisation or national context in a systemised way through considering a standard and comprehensive set of scoping questions. To the right of the table is a comments section to allow justification to be given where certain topic aspects are scoped out from consideration.

The Framework has two types of topics - 20 impact based topics and 6 procedural topics. Impact topics are illustrated with the screenshots to the right of the page. Procedural topics are only completed as far as the scoping stage. The scoring questions for these topics are designed to establish whether the 'procedure' in question is relevant and applied to the project, e.g. an EIA.

Procedural topics are all contained on a single page accessed from the bottom right of the homepage matrix of topics.

Fig. 1. Use the light blue matrix of hyperlinks on the homepage to access each topic page. Topic pages can be accessed from the homepage or summary page.

Fig. 2. Use the Yes/No dropdown boxes to answer each scoping section (it is recommended the NRA does this).

Step 2: Setting targets and identifying indicators

For each of the sustainability topic aspect scoped into the Framework, targets should be set and indicators identified. Whilst the Project Framework suggests considerations for setting targets and relevant indicators, it is up to the user to decide on these. The Project Framework is designed to encourage users to set targets and appropriate methods to record performance against those targets, including the means of collecting performance data.

For each target and indicator row a responsible ‘actor’ should be assigned (either the Client, Designer or Contractor, or a combination...
Tool example topic page

ENERGY EFFICIENCY

TOPIc DESCRIPTION
Energy Efficiency is good for both the environment and your bottom line. The tool identifies energy options at the top of the energy hierarchy to either eliminate the need for energy or reduce the energy intensity per unit of product or service.

Topics:
- Energy reduction: measures to improve energy efficiency.
- Energy efficiency: measures to improve energy efficiency.

Reference all relevant asset/product stages:
- Pre-design: Not relevant.
- Design: The designer should consider the energy use in lighting and communications equipment to be used on the network (including charging the need for lighting and other equipment) and also consider the energy intensity of required maintenance (such as heat engineering and the use of water).
- Construction and maintenance: The contractor should consider the energy efficiency of plant, vehicles and processes (for all site activities) and take measures to improve efficiency and reduce overall energy consumption in the final decisions taken over the equipment and vehicles as well as new operation in best practices operating techniques to reduce energy consumption.
- Operation and maintenance: During maintenance activities, the contractor should consider the energy efficiency of plant, vehicles and processes (for all site activities) and take measures to improve efficiency and reduce overall energy consumption through decisions taken over the equipment and vehicles as well as new operation in best practices operating techniques to reduce energy consumption.
- Decommissioning: Not relevant.

Best practice:
Energy efficiency is the best approach to reduce energy demand and where large reductions in energy can be conserved, mitigating climate change through offsetting energy demand for reducing the intensity of energy use.

SCOPING KEY TOPIC ASPECTS

The SIA should incorporate the scoping section below to determine the key aspects for consideration within the SIIA Project Framework. Based on the scoping responses, topic aspects are scoped in and out for performance measurement on the project, where aspects are scoped in, the framework provides suggestions for targets and indicators. Alternatively, users can set targets and indicators of their own.

<table>
<thead>
<tr>
<th>No.</th>
<th>Scoping question</th>
<th>Scoping response</th>
<th>Considerations for assessing targets</th>
<th>Suggested indicators</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>What national policy or regulation set specific objectives, standards or targets for energy efficiency on road projects?</td>
<td>Yes</td>
<td>Pre-design: Not relevant. Design: Use specific legislation or guidance to set relevant targets and indicators for the project.</td>
<td>Use specific legislation or guidance to set relevant targets and indicators for the project.</td>
<td>Decommissioning: Not relevant.</td>
</tr>
<tr>
<td>7.2</td>
<td>何 specific project set specific objectives, standards or targets for energy efficiency on road projects?</td>
<td>Yes</td>
<td>Design: Use specific project set specific objectives, standards or targets for energy efficiency on road projects.</td>
<td>Use specific project set specific objectives, standards or targets for energy efficiency on road projects.</td>
<td>Decommissioning: Not relevant.</td>
</tr>
<tr>
<td>7.3</td>
<td>Site specific issues: Are there any specific issues (opportunities or constraints) relevant to specific energy efficiency which the project should consider?</td>
<td>Yes</td>
<td>Pre-design: Not relevant. Design: Apply specific opportunities to improve energy efficiency of equipment, vehicles and construction techniques. Staff training to improve performance.</td>
<td>Apply specific opportunities to improve energy efficiency of equipment, vehicles and construction techniques. Staff training to improve performance.</td>
<td>Decommissioning: Not relevant.</td>
</tr>
<tr>
<td>7.4</td>
<td>ENERGY INTENSIVITY: Does the project include equipment/lighting requiring energy in the design?</td>
<td>Yes</td>
<td>Pre-design: Not relevant. Design: Target performance considerations: Measures to reduce overall energy consumption and improve efficiency of equipment, vehicles and construction techniques. Staff training to improve performance.</td>
<td>Measures to reduce overall energy consumption and improve efficiency of equipment, vehicles and construction techniques. Staff training to improve performance.</td>
<td>Decommissioning: Not relevant.</td>
</tr>
<tr>
<td>7.5</td>
<td>OPERATIONAL ENERGY INTENSIVITY: Does the project include equipment/lighting requiring energy in the design?</td>
<td>Yes</td>
<td>Pre-design: Not relevant. Design: Target performance considerations: Measures to reduce overall energy consumption and improve efficiency of equipment, vehicles and construction techniques. Staff training to improve performance.</td>
<td>Measures to reduce overall energy consumption and improve efficiency of equipment, vehicles and construction techniques. Staff training to improve performance.</td>
<td>Decommissioning: Not relevant.</td>
</tr>
</tbody>
</table>

SUSTAINABILITY TARGETS AND INDICATORS

The SIA should incorporate the scoping section below to determine the key aspects for consideration within the SIIA Project Framework. For each aspect (and subsequent target) as responsible ‘actor’ should be identified, indicating the organisation responsible for incorporating the target into the project. The project stage at which the impact can be expected to occur should also be identified. This may not be the same as the stage at which the impact has to be considered and managed (planned, mitigated, compensated for, or addressed in another way) by the identified responsible ‘actor’.

Multiple targets can be set per topic aspect to account for multiple elements of an aspect. Assign separate targets to different ‘actors’, assign different targets for different project stages or assign different targets for different asset life cycle stages.

Add aspect name to: EU national policy & regulation

Select which aspect to add a new target/indicator name to:

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
<th>Responsible ‘actor’ (e.g., client, designer or partner)</th>
<th>Project stage and/or impact (Select)</th>
<th>Target</th>
<th>Indicator</th>
<th>Outcome</th>
<th>Performance</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EU national policy &amp; regulation</td>
<td>Client (C)</td>
<td>Operation</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
</tr>
<tr>
<td>2</td>
<td>EU framework</td>
<td>Client (C)</td>
<td>Operation</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
</tr>
<tr>
<td>3</td>
<td>Specific issues</td>
<td>Client (C)</td>
<td>Operation</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
</tr>
<tr>
<td>4</td>
<td>Energy reduction</td>
<td>Client (C)</td>
<td>Operation</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
</tr>
<tr>
<td>5</td>
<td>Operational energy efficiency</td>
<td>Client (C)</td>
<td>Operation</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
<td>ECO</td>
</tr>
</tbody>
</table>
ENERGY EFFICIENCY

**Thickness description**

Energy Efficiency is a goal to reduce the amount of energy required to provide a product or service. Energy Efficiency describes energy options at the top of the energy hierarchy to either eliminate the need for energy or reduce the energy intensity per unit of product or service.

**Topic aspects:**

- Energy reduction – where possible eliminating the need for energy consumption.
- Energy efficiency – delivering the various services of the road network with a reduced energy intensity.
  - For renewable or low-carbon energy and energy/fuel efficiency of road users see the Climate Change Mitigation topic.

**Relevance at different asset lifecycle stages:**

- **Pre-Design:** Not relevant.
- **Design:** The designer should consider the energy use in lighting and communications equipment to be used on the network (including challenging the need for lighting and other equipment) and also consider the energy intensity of required maintenance (both for hard engineering and the soft estate).
- **Construction and maintenance:** During construction, the contractor should consider the energy efficiency of plant, vehicles and processes (for all site activities) and take measures to improve efficiency and reduce overall energy consumption through decisions taken over the equipment and vehicles used as well as training operatives in best practices operating techniques to reduce energy consumption.
- **Operation and maintenance:** During operation activities, the contractor should consider the energy efficiency of plant, vehicles and processes (for all site activities) and take measures to improve efficiency and reduce overall energy consumption through decisions taken over the equipment and vehicles used as well as training operatives in best practices operating techniques to reduce energy consumption.
- **Decommissioning:** Not relevant.

**Best practice:**

Energy efficiency is in itself a best practice approach to reducing energy demand and where carbon intensive sources of energy are consumed mitigating climate change through eliminating energy demand for reducing the intensity of energy use.

---

**SCOPING KEY TOPIC ASPECTS**

The NRA should complete the scoping section below to determine the key aspects for consideration within the SUNRA Project Framework. Based on the scoping response, topic aspects are scoped in or out for performance measurement on the project. Where aspects are scoped in, the framework provides suggestions for targets and indicators. Alternatively, users can set targets and indicators of their own.

<table>
<thead>
<tr>
<th>No.</th>
<th>Scoping question</th>
<th>Scoping response</th>
<th>Considerations for setting targets. Suggested indicators</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 7.1 | **EU/NATIONAL POLICY & LEGISLATION:** Does European or national policy or legislation set objectives, minimum standards or targets for energy efficiency on road projects? | Yes              | **Pre-design:** Not relevant.  
  **Design, construction, operation and maintenance:** Use specific legislative or policy targets to set relevant targets and indicators for the project.  
  **Decommissioning:** Not relevant. |          |
| 7.2 | **NRA POLICY:** Does client (NRA) policy set specific objectives, standards or targets for energy efficiency on road projects? | Yes              | **Pre-design:** Not relevant.  
  **Design, construction, operation and maintenance:** Use NRA specific objectives to set relevant targets and indicators for the project.  
  **Decommissioning:** Not relevant. |          |
| 7.3 | **SITE SPECIFIC ISSUES:** Are there site specific issues - opportunities or constraints - relevant to energy efficiency which the project should consider? | No               |                                                                                                                             |          |
| 7.4 | **ENERGY REDUCTION:** Does the project include equipment/lighting requiring energy in the design? | Yes              | **Pre-Design:** Not relevant.  
  **Design:** Target performance considerations: Designing-out energy demand through the removal of equipment or lighting change in the operating regime.  
  **Construction:** Target performance considerations: Measures to reduce onsite energy consumption and improve efficiency of equipment, vehicles and construction techniques. Staff training to improve performance.  
  **Indicators:** Energy efficiency of construction equipment, vehicles and techniques. Number of staff trained in the energy efficient operation of equipment.  
  **Operation and maintenance:** Target performance considerations: Measures to reduce onsite energy consumption and improve efficiency of equipment, vehicles and maintenance techniques. Staff training to improve performance.  
  **Indicators:** Energy efficiency of maintenance equipment, vehicles and techniques. Number of staff trained in the energy efficient operation of equipment. |          |
### ENERGY REDUCTION: Does the project include equipment/lighting requiring energy in the design?

| Pre-Design: | Not relevant. |
| Design: | Target/performance considerations: Designing-out energy demand through the removal of equipment or lighting/ change in the operating regime. |
| Indicators: | Annual kWh energy demand for the project in operation, kWh reduction in demand. |
| Construction: | Target/performance considerations: Measures to reduce on-site energy consumption and improve efficiency of equipment, vehicles and construction techniques. Staff training to improve performance. |
| Indicators: | Energy efficiency of construction equipment, vehicles and techniques. Number of staff trained in the energy efficient operation of equipment. |
| Operation and maintenance: | Target/performance considerations: Measures to reduce on-site energy consumption and improve efficiency of equipment, vehicles and maintenance techniques. Staff training to improve performance. |
| Indicators: | Energy efficiency of maintenance equipment, vehicles and techniques. Number of staff trained in the energy efficient operation of equipment. |

### OPERATIONAL ENERGY EFFICIENCY: Does the project include equipment/lighting requiring energy in the design? Or do site activities require energy consumption?

| Pre-Design: | Not relevant. |
| Design, operation: | Target/performance considerations: Measures to reduce improve the efficiency of equipment installed or maintained as part of the project. |
| Indicators: | Reducing in energy demand compared to the baseline (kWh). |
| Construction: | Target/performance considerations: Measures to reduce on-site energy consumption and improve efficiency of equipment, vehicles and construction techniques. Staff training to improve performance. |
| Indicators: | Energy efficiency of the plant, vehicles and techniques. Number of staff trained in the energy efficient operation of equipment. |
| Maintenance, decommissioning: | Not relevant. |

### SUSTAINABILITY TARGETS AND INDICATORS

The NRA (or other client), working with the project team, should set targets and indicators for each topic aspect that has been scoped into the SUNRA Project Framework.

For each aspect (and subsequent target) as responsible 'actor' should be identified, indicating the organisation responsible for incorporating the target into the project.

The project stage at which the impact can be expected to occur should also be identified. This may not be the same as the stage at which the impact has to be considered and managed (avoided, mitigated, compensated for, or addressed in another way) by the identified responsible 'actor'.

Multiple targets can be set per topic aspect to account for multiple elements of an aspect. Assign separate targets to different 'actors', assign different targets for different project stages or assign different targets for different asset lifecycle stages.

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
<th>Responsible 'actor' (Client, Designer or Contractor)</th>
<th>Project stage (when impact occurs)</th>
<th>Target</th>
<th>Indicator</th>
<th>Outcome record (include date; initials; outcome)</th>
<th>Performance</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EU/ national policy &amp; legislation</td>
<td>Client (C)</td>
<td>Operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>NRA policy</td>
<td>C1-D</td>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Standard practice</td>
<td>C1-D-Co</td>
<td>Construction</td>
<td>Measures implemented to improve site plant energy</td>
<td>Overall fuel consumption</td>
<td>Training implemented; some improvements implemented.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Energy reduction</td>
<td>C1-D-Co</td>
<td>Construction</td>
<td>Measures implemented to improve site plant energy</td>
<td>Overall fuel consumption</td>
<td>Training implemented; some improvements implemented.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Operational energy efficiency</td>
<td>Designer (D)</td>
<td>Operation</td>
<td>50% reduction in energy demand compared to baseline</td>
<td>kWh energy consumption over design life</td>
<td>50% achieved</td>
<td>Target achieved</td>
<td></td>
</tr>
</tbody>
</table>
Dissemination

- The final versions of the tool will be uploaded onto the SUNRA website and sent around to all contacts made through the project.

- ‘SUNRA – a sustainability rating system framework for National Road Administrations’ has been accepted for TRA 2014 in April.
Contact details

Clare Harmer
charmer@trl.co.uk
+44 (0)1344 770451

Chris Sowerby
Chris.Sowerby@ch2m.com
+44 (0)113 220 8468

http://www.projectsunra.eu/
Thank you!

On behalf of all of the SUNRA project team