

Briefing on the Innovation Call for Environment Services Solutions

06 Feb 2018



Overview

1. Introduction & Administrative Details on this Innovation Call
2. Problem Statements:
 - (A) To develop a safe, efficient and cost effective kitchen exhaust duct cleaning solution
 - (B) To develop a self-cleaning toilet to enhance productivity of cleaners and improve toilet cleanliness for users
 - (C) To reduce the physical strain of the work crew in waste collection operation
 - (D) To develop a cost-effective and efficient on-site non-domestic mixed waste treatment system

Introduction

- Environmental Services Industry Transformation Map (ES ITM) launched:
 - To achieve **Zero Waste** vision and a **clean and liveable** Singapore
- NEA and SPRING Singapore have jointly launched an innovation call for the cleaning and waste management industry:
 - To encourage greater use of **technology and automation**
 - To increase the **overall productivity**
- Purpose of this Innovation Call is to:
 - Evaluate and **test-bed suitable technologies** that can improve the efficiency of both NEA and industry operations related to the cleaning and waste management
 - **Support local SMEs / start-ups** in developing competitive technologies for application in the Environmental Services Sector

Key dates and indicative timeline

Date:	Description:
29 Jan 2018	Launch of Innovation Call for Environmental Services Solutions
6 Feb 2018	Technical Briefing
26 Apr 2018	Closing date of call - <i>Submission of application via Gov-PACT portal (by 12:00 hrs)</i>
May – Jun 2018	Evaluation and clarification of proposals
Jul 2018	Award of projects

Who can apply?

Applicant – Nature of Organisation	Funding Support
<p>Local Small and Medium Enterprises (SMEs)</p> <ul style="list-style-type: none">• <i>For SMEs, the companies must fulfil the following criteria:</i><ul style="list-style-type: none">- <i>Registered and operating in Singapore,</i>- <i>Have minimum 30% local shareholding,</i>- <i>Have group annual sales turnover of not more than S\$100 million, or group employment of not more than 200 employees</i>	<p>Up to 70% of qualifying project cost</p> <ul style="list-style-type: none">• <i>Qualifying cost includes</i><ul style="list-style-type: none">- <i>Manpower costs, Equipment/software, Testing and certification, Consultancy, IP</i>• <i>Examples of non-qualifying cost:</i><ul style="list-style-type: none">- <i>Maintenance, warranty</i>

- Interested foreign technology providers are recommended to work with local SMEs

Evaluation Criteria

Evaluation Criterion	Weightage (%)
1. Effectiveness of solution <ul style="list-style-type: none">• <u>effectively address</u> the respective problem statements• whether a <u>transformative or incremental improvement</u> approach was taken• <u>relevance</u> to Singapore's context and NEA or industry's needs.	30
2. Feasibility of solutions to be deployed in actual environments <ul style="list-style-type: none">• <u>technical and economic feasibility</u> for deployment in an actual working environment.• estimated <u>operating and life cycle costs</u> upon deployment	30
3. Cost effectiveness and potential to scale up and ease of implementation <ul style="list-style-type: none">• <u>cost effectiveness for scaling up</u> on a large-scale basis in various premises/sites/operations.• pose <u>minimal/no nuisance and disruption</u> to existing operations.• <u>minimal alterations</u> to install and operate	20
4. Capacity and expertise to execute project <ul style="list-style-type: none">• requisite <u>capabilities and resources</u> to undertake the research/innovation project.	20
Total Score	100

Points to note

- Proposed solutions should fulfil the following criteria:
 - Must not be readily or commercially available in the market
 - Development of the solutions must not have commenced at the point of proposal submission
 - Technologies should aim to:
 - Enhance safety of operations; and/or
 - Reduce reliance of manpower; and/or
 - Improve quality, consistency and service delivery; and/or
 - Achieve cost-savings; and/or
 - Improve efficiency/productivity

Points to note

- Required Technology Readiness Level : TRLs 5 – 8 only
- Duration of project : not exceeding 2 years
- Disbursements : on a reimbursement basis, based on project milestones achieved
- Submission of proposals via Gov-PACT portal (<https://gov-pact.ipi-singapore.org>) :
 - By 26 Apr 2018, 12:00 hrs

Points to note

- Further enquiries: For further enquiries on this Innovation Call, please email:

- ESITM_Innovation@nea.gov.sg – National Environmental Agency for:
 - Matters pertaining to the problem statements

Note: *If your enquiry is specific to a particular problem statement, please remember to include the title of the problem statement in your subject title. Thank you.*

- Gov-pact@ipi-singapore.org – IPI Singapore for assistance on:
 - *Using the Gov-PACT portal for registration of technical briefing registration, submission of proposal, etc*
 - *Matching technology partners to collaborate with for this innovation call*
 - *Funding enquiry*

Problem Statements

[A] To develop a safe, efficient and cost effective kitchen exhaust duct cleaning solution

Presented by:

Linda Ho, Senior Executive (Maintenance Management),
Hawker Centres Division

(A) Safe, Efficient & Cost Effective Kitchen Exhaust Duct Cleaning Solution

Background

- a) Kitchen Exhaust Ducts (KED) have to be cleaned regularly to prevent grease accumulation which poses fire hazards.
- b) Labour-intensive and time-consuming.
- c) Access panels will have to be cut out for cleaners to enter. Cleaners will only clean areas which they can possibly reach.

Desired Outcome

- a) A safe, efficient and effective method for kitchen exhaust duct cleaning.
- b) Reduce risk of spreading of fire due to grease accumulation in kitchen exhaust ducts.



Manual Cleaning of KED

Singapore

Fire breaks out in VivoCity shopping mall

SINGAPORE: A fire broke out at Japanese restaurant Shin Kushiya at VivoCity shopping mall on Friday (Dec 22).

The Singapore Civil Defence Force (SCDF) said it was alerted of the incident at 11.35am.

The fire involved the kitchen exhaust duct in a restaurant on the second floor of the mall, said SCDF.

It added that the fire was extinguished by the company's emergency response team prior to their arrival. There were no reported injuries and the cause of fire is under investigation, it said.

Fire Involved KED

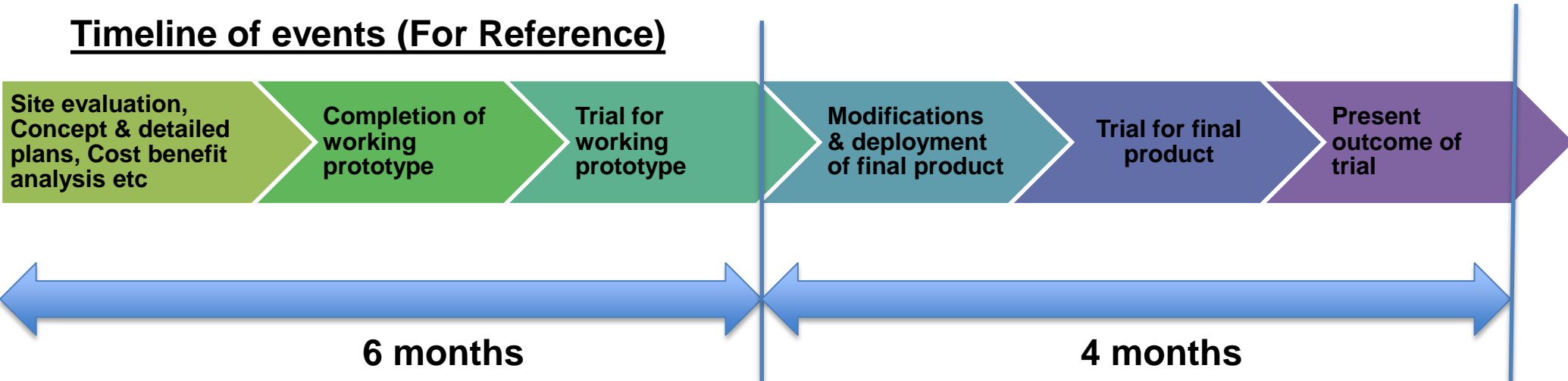
(A) Safe, Efficient & Cost Effective Kitchen Exhaust Duct Cleaning Solution

Key Requirements

- i. Able to operate in greasy environment. Does not cause damages / degrade existing KED and exhaust system.
- ii. Existing KED are able to withstand weight of cleaning equipment used.
- iii. Able to clean KED in different shapes and sizes.
- iv. Able to clean interior and exterior of KED. Able to clean hard-to-clean areas.
- v. Provide protection measures to protect premises from dust and debris.
- vi. Remotely-operated equipment is preferred.
- vii. Total power consumption does not exceed power supply allowable in the premise. Will not cause power trip.
- viii. Does not disrupt business operation. Able to comply with any statutory regulation on permissible noise, work hours and worksite safety. Cleaning is to be carried out after operation hours.
- ix. Able to take photos or videos or both of condition of duct and cleaning process.
- x. A report with before and after photographs / videos is to be provided for every cleaning service.
- xi. Less time-consuming and labour-intensive. Does not exceed existing market rates. Existing market rate for KED cleaning (twice a year) ranges from \$7,000 to \$40,000 per year per centre.

(A) Safe, Efficient & Cost Effective Kitchen Exhaust Duct Cleaning Solution

Timeline of events (For Reference)



- Deliverables include:-

- Provide Cost Benefit Analysis of proposed solution.
- Provide regular updates on progress.
- Conduct trial run at selected site.
- Conduct site visit to view actual cleaning process.
- Reports with before and after photographs, videos and statistics/readings etc. are to be provided.
- Conduct presentations to the Management and cleaning contractors/partners on the outcome of trial.

(A) Safe, Efficient & Cost Effective Kitchen Exhaust Duct Cleaning Solution

Costing & Procurement

- Procurement budget for engagement of proposed solution is estimated at \$30,000 per unit.

Market Potential for Proposed Solution/Product

- Proposed solution could be adopted by operators and premise owners in F&B sector (e.g. food centre, restaurant, coffee shop, food court, canteen, centralised kitchen).

[B] To develop a self-cleaning toilet to enhance productivity of cleaners and improve toilet cleanliness for users

Presented by:

Mr Chow Kai Wen, Assistant Director (Tenancy Management),
Hawker Centres Division

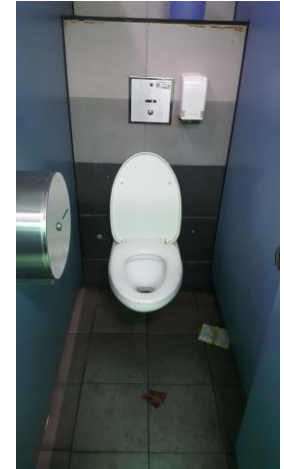
(B) Self-Cleaning Toilet to Enhance Productivity for Cleaners and Improve Toilet Cleanliness for Users

Background

- a) Toilet cleaners are being deployed to clean toilets periodically and it is a challenge to maintain the cleanliness of toilets.
- b) Faulty fittings and emptied supplies are being detected during inspections or reported by users, resulting in delay in rectification.

Desired Outcome

- i. Lesser reliance on manpower and improved cleanliness
- ii. Toilets can be self-cleaned
- iii. Toilet supplies are replenished timely
- iv. Reduce toilet downtime by sending alerts to contractor upon detection of breakdowns
- v. Easy maintenance of system/equipment
- vi. System/equipment to work within allowable power supply to avoid power trip.
- vii. Safe for users
- viii. Efficient usage of water
- ix. Able to collate and analyse data on toilet usage and breakdown etc., and translate into reports and findings.
- x. Provides data on web based dashboard to allow users to access remotely on smartphone, iPad and PC etc.
- xi. Allows integration with other systems when required.
- xii. In compliance with SS 499:2002 (2015) Cleaning Service Industry – Cleaning Performance for Commercial Premises.



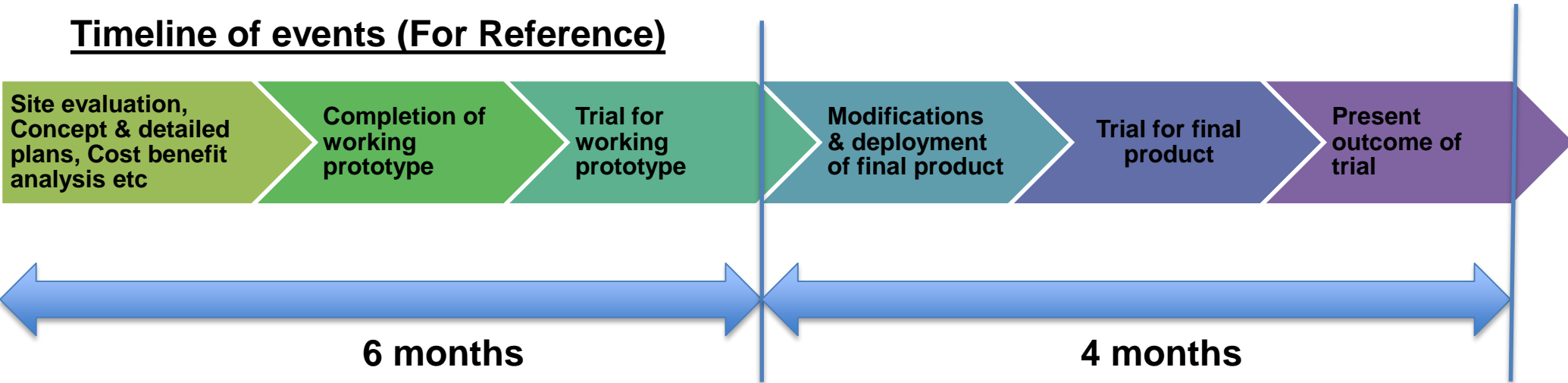
Littered and wet floor



Urinal choked

(A) Safe, Efficient & Cost Effective Kitchen Exhaust Duct Cleaning Solution

Timeline of events (For Reference)



- Deliverables include:-
 - i. Provide Cost Benefit Analysis of proposed solution.
 - ii. Provide regular updates on progress.
 - iii. Conduct trial run at selected site.
 - iv. Conduct site visit to view actual cleaning process.
 - v. Reports with before and after photographs, videos and statistics/readings etc. are to be provided.
 - vi. Conduct presentations to the Management and cleaning contractors/partners on the outcome of trial.

(B) Self-Cleaning Toilet to Enhance Productivity for Cleaners and Improve Toilet Cleanliness for Users

Costing & Procurement

- Procurement budget for engagement of proposed solution is estimated at \$130,000 for two toilet cubicles.

Market Potential for Proposed Solution/Product

- Proposed solution could be adopted by building owners, managing agents, toilet cleaning contractors and FM contractors in the cleaning and FM industry.

(C) To reduce the physical strain of the work crew in waste collection operation

Presented by:

Mr Charles Wee, Assistant Director (Cluster Development),
Industry Development & Promotion Office

Assistive Technologies for Waste Collection Operations

Background

- Public Waste Collectors currently perform waste collection from public housing and trade premises on a daily basis
- Each collection team is comprised of a driver and 2 collection crew plying through the streets to perform collection from 120L bins to 660L bins
- Due to the different terrains coupled with heavy bins (~300-400kg) from certain types of premises, the moving of bins from location to location is made difficult

Challenge Statement

- To develop a cost effective, compact, portable & easy to operate system able to deploy in multiple terrains without negative impact to current collection operations
- Solution should also help to improve the working conditions of the collection crew

Desired Outcome

- Improvement in working conditions & work life for waste collection crew
- Eliminate the occurrence of workplace
- Improve productivity of collection operations

What We are not looking for

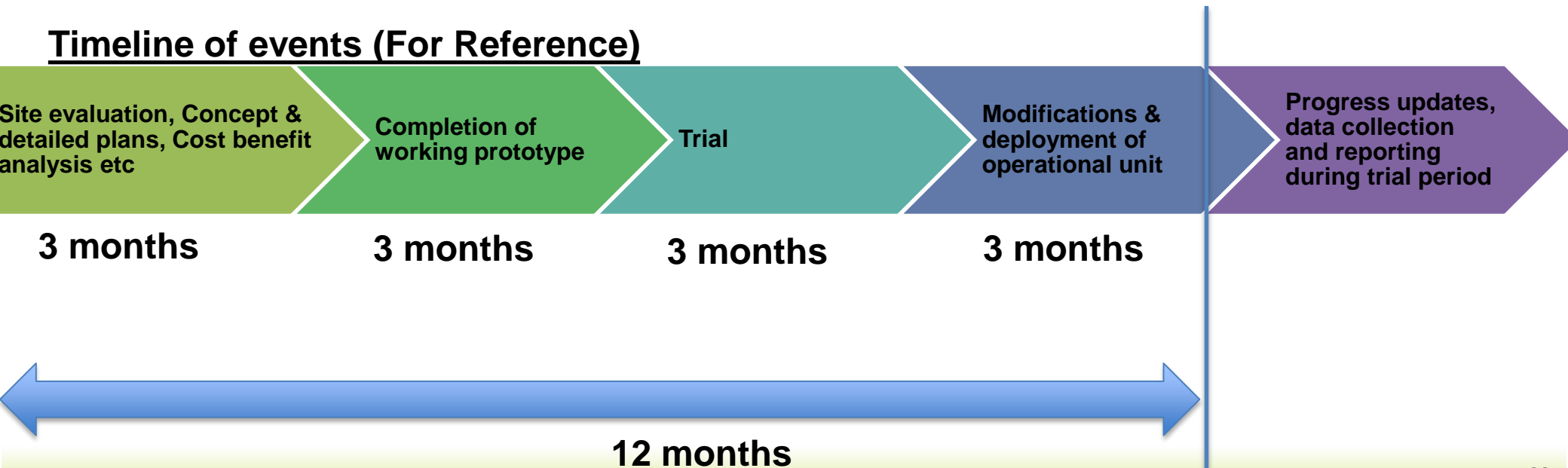
Technologies/equipment which negatively impacts current collection operations

Assistive Technologies for Waste Collection Operations

Key Requirements

- Compact and portability
- Ease to operate and productive
- Cost effective
- Improvement of working environment to collection crew

Timeline of events (For Reference)



(D) To develop a cost-effective and efficient on-site non-domestic mixed waste treatment system

On-site Waste-to-Energy (WTE) solution for Premises Owners

Background

- With the recently launched Industry Transformation Map, NEA established a working platform with industry partners to explore, trial and adopt proven innovative technologies to better address the environment problems
- Non-domestic waste (e.g. food waste mixed with packaging, contaminated plastics etc) is currently collected by licensed by General Waste Collectors (GWCs) for treatment in licensed general waste disposal facilities
- Even with recycling efforts by premises, waste generators still send significant waste to incineration plants before landfilling
- Existing on-site waste treatment requires diligent source segregation (E.g. food waste machines)

Challenge Statement

- To develop a compact, reliable, efficient & easy to operate system able to treat multiple waste streams without segregation and short turnaround time. Products (if any) should be useful and value added products to all types of premises owners

Desired Outcome

- Reduction in waste sent for landfilling
- Waste as a resource

What We are not looking for

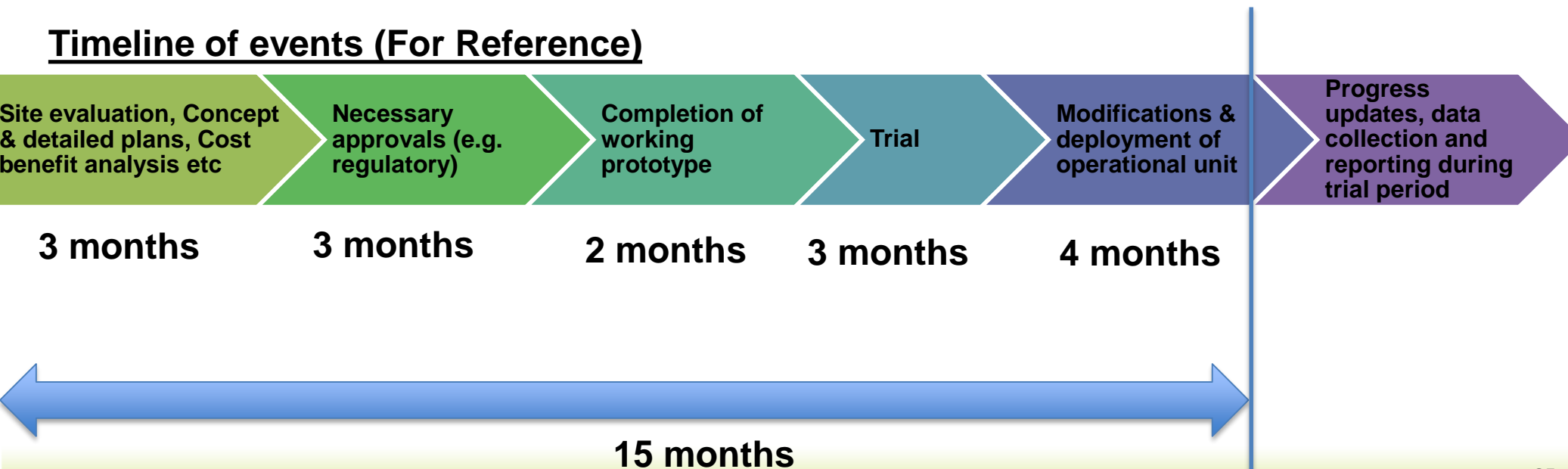
- Aerobic/anaerobic digestion or incineration systems

On-site Waste-to-Energy (WTE) solution for Premises Owners

Key Requirements

- Compact suitable for premises with space constraints
- Efficient (e.g high energy output/tonne of waste, fast conversion rate etc)
- Minimal noise/smell during operations
- Suitability for use in local waste profiles
- Adhere to the necessary regulatory requirements

Timeline of events (For Reference)



Our Environment

Safeguard • Nurture • Cherish