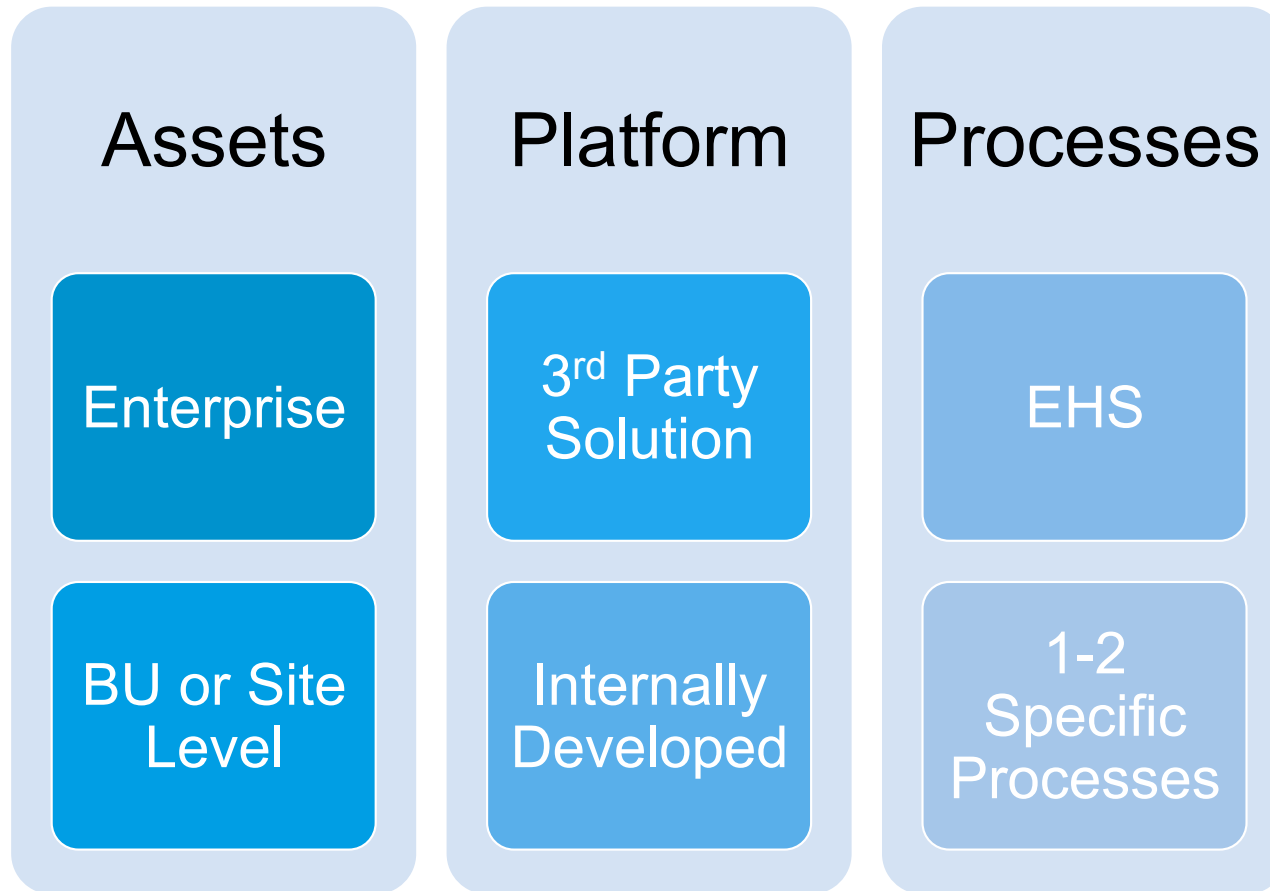
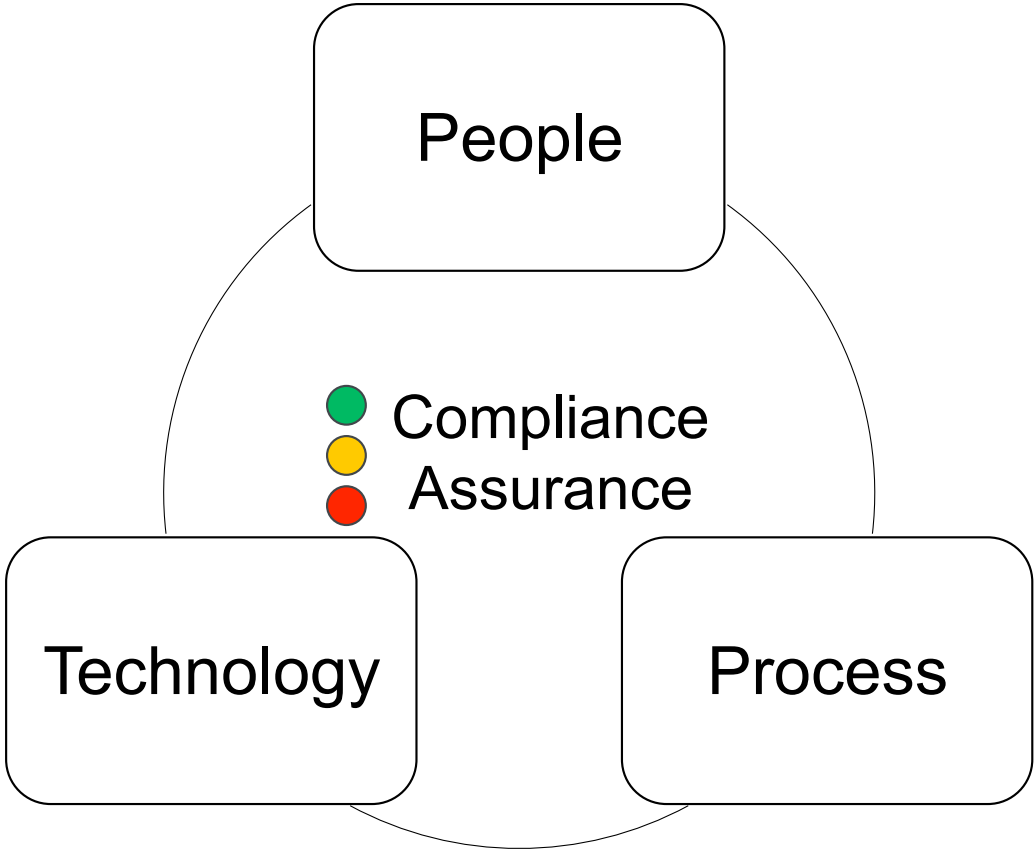
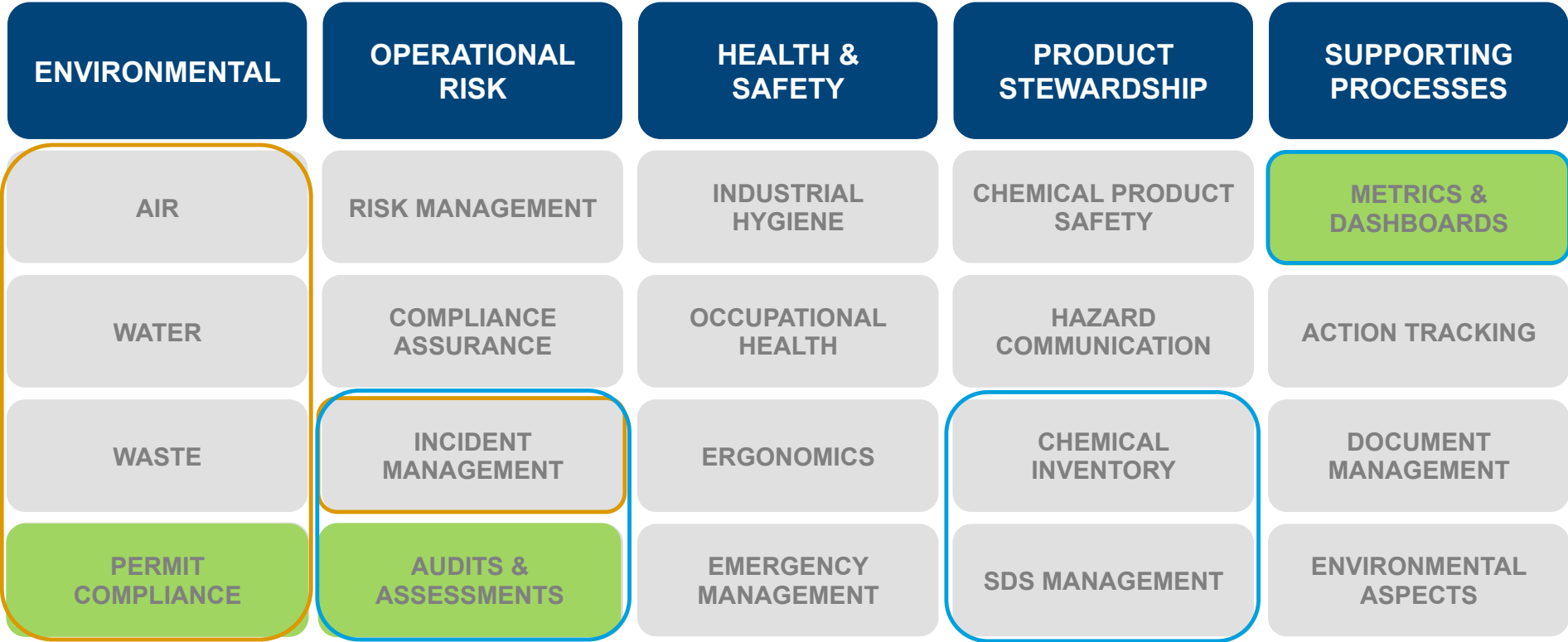


Environmental Management Information Systems (EMIS)





EMIS Scope



Permit Tracking

Where is the data stored?

How can I visualize the data?

Permit Tracker – Excel Based Data Source

Table Tools Permit Tracker and Dashboard Example.xlsx - Excel

File Home Insert Page Layout Formulas Data Review View Design Tell me what you want to do... Stephanie Nicholson

A1 Site

	A	B	C	D	E	F	G	H	I	J	K	L
1	Site	City	State	EPA Region	Site Operator	Site EHS Contact	Permit Type	Permit Number	Permit Description	Permit Status	Permit Effective Date	Permit Expiration Date
2	Buchanan	Buchanan	VA	3	Test	Stephanie Nicholson	Title V	SWR012345	Two simple cycle turbines firing landfill gas	renewal application under developmen	4/29/2014	4/28/2019
3	Doswell	Doswell	VA	3	Energy123	Jane Smith	Title V	PR0123456	4 combined cycle and 3 simple cycle turbine	renewal application under developmen	9/17/2014	9/16/2019
4	Sammy Plant : Baltimore	MD	3	ERM	Sammy Lakshmanar	Sammy Lakshmanar	Title V	ABC1234	Example Permit	Draft; in review	6/1/2018	6/30/2018
5	Sammy Plant : Raleigh	NC	3	ERM	Sammy Lakshmanar	Sammy Lakshmanar	NPDES	WW112233	Outfall permit	Final	6/1/2017	5/31/2018
6	Sammy Plant : Houston	TX	7	Test	Sammy Lakshmanar	Sammy Lakshmanar	Title V	ABC123	Air Operating Permit	Active	1/1/2018	1/1/2019
7	Sammy Plant : Dallas	TX	7	ERM	Sammy Lakshmanar	Sammy Lakshmanar	Title V	XYZ123	Air Operating Permit	Active	1/1/2018	1/1/2019
8	Sammy Plant : Houston	TX	8	ERM	Sammy Lakshmanar	Sammy Lakshmanar	Title V	123	Air Operating Permit	Active	10/1/2018	11/1/2018
9	Sammy Plant : Detroit	MI	9	ERM	Nico Wilson	Nico Wilson	NPDES	ABC	Stormwater Permit	Active	10/1/2018	11/1/2018

Permit Tracker – SharePoint List

Test - Permit Tracker

[See all](#)

[+ New](#) [Export to Excel](#)

[All Items](#)

Site	City	State	EPA Region	Site Operator	Site EHS Contact	Permit Type	Permit Number
Buchanan	Buchanan	VA	3	Test	Stephanie Nicholson	Title V	SWR012345
Doswell	Doswell	VA	3	Energy123	Jane Smith	Title V	PR0123456
Sammy Plant 1	Baltimore	MD	3	ERM	Sammy Lakshmanan	Title V	ABC1234
Sammy Plant 2	Raleigh	NC	3	ERM	Sammy Lakshmanan	NPDES	WW112233
Sammy Plant 3	Houston	TX	7	Test	Sammy Lakshmanan	Title V	ABC123
Sammy Plant 4	Dallas	TX	7	ERM	Sammy Lakshmanan	Title V	XYZ123
Sammy Plant 5	Houston	TX	8	ERM	Sammy Lakshmanan	Title V	123

Permit Tracker – Example Power BI Dashboard



Permit Tracker Dashboard

State

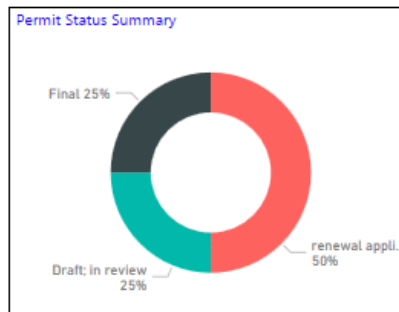
- MD
- NC
- VA

Total Permits

4

Active Permits

2



Overdue Permits

Site	Permit Type	Permit Number	Permit Expiration Date	Permit Status
Sammy Plant 1	Title V	ABC1234	6/30/18	Draft
Sammy Plant 2	NPDES	ABC123	5/31/18	Final

Permit Type

- NPDES
- Title V

Renewal Due

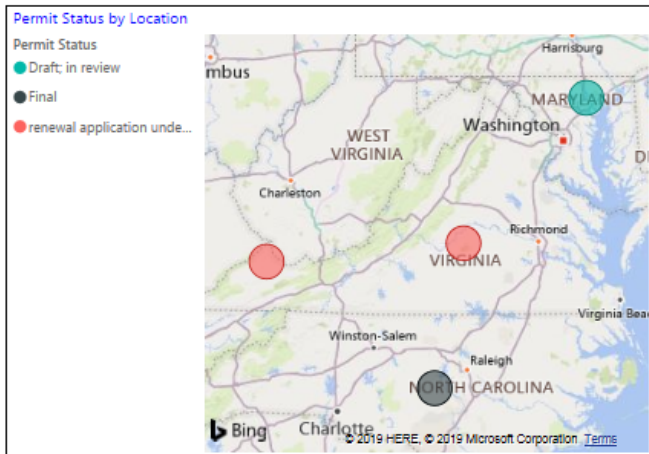
3

Past Expiration Date

2

Renewal Due Permits

Site	Permit Type	Permit Number	Permit Expiration
Buchanan Generation, LLC	Title V	SWRO11390	4/28/19
Sammy Plant 1	Title V	ABC1234	6/30/18

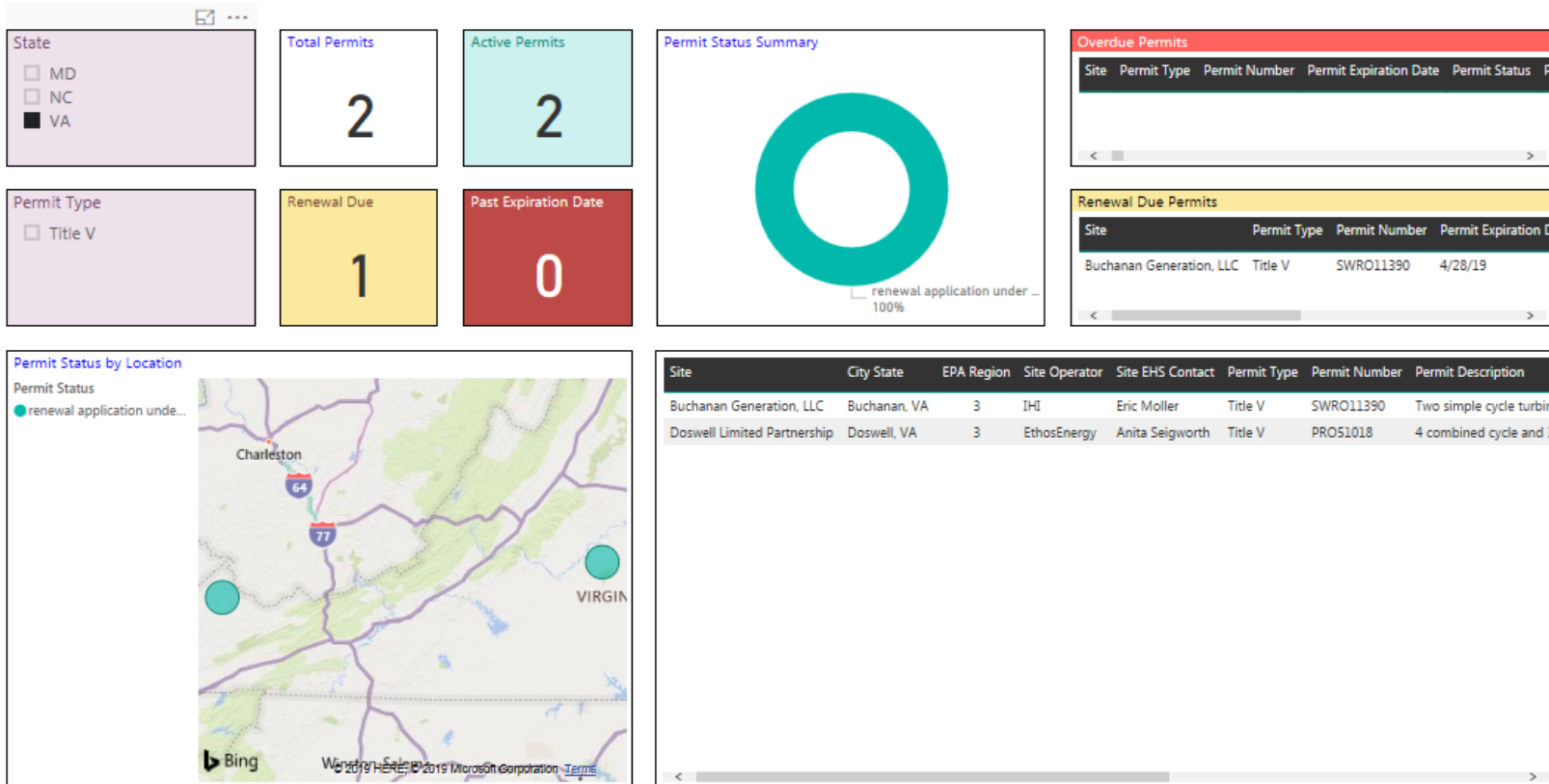


Site	City	State	EPA Region	Site Operator	Site EHS Contact	Permit Type	Permit Number	Permit Description
Buchanan Generation, LLC	Buchanan	VA	3	IHI	Eric Moller	Title V	SWRO11390	Two simple cycle tur
Doswell Limited Partnership	Doswell	VA	3	EthosEnergy	Anita Seigworth	Title V	PROS1018	4 combined cycle ar
Sammy Plant 2	Raleigh	NC	3	ERM	Sammy Lakshmanan	NPDES	ABC123	Outfall permit
Sammy Plant 1	Baltimore	MD	3	ERM	Sammy Lakshmanan	Title V	ABC1234	Example Permit

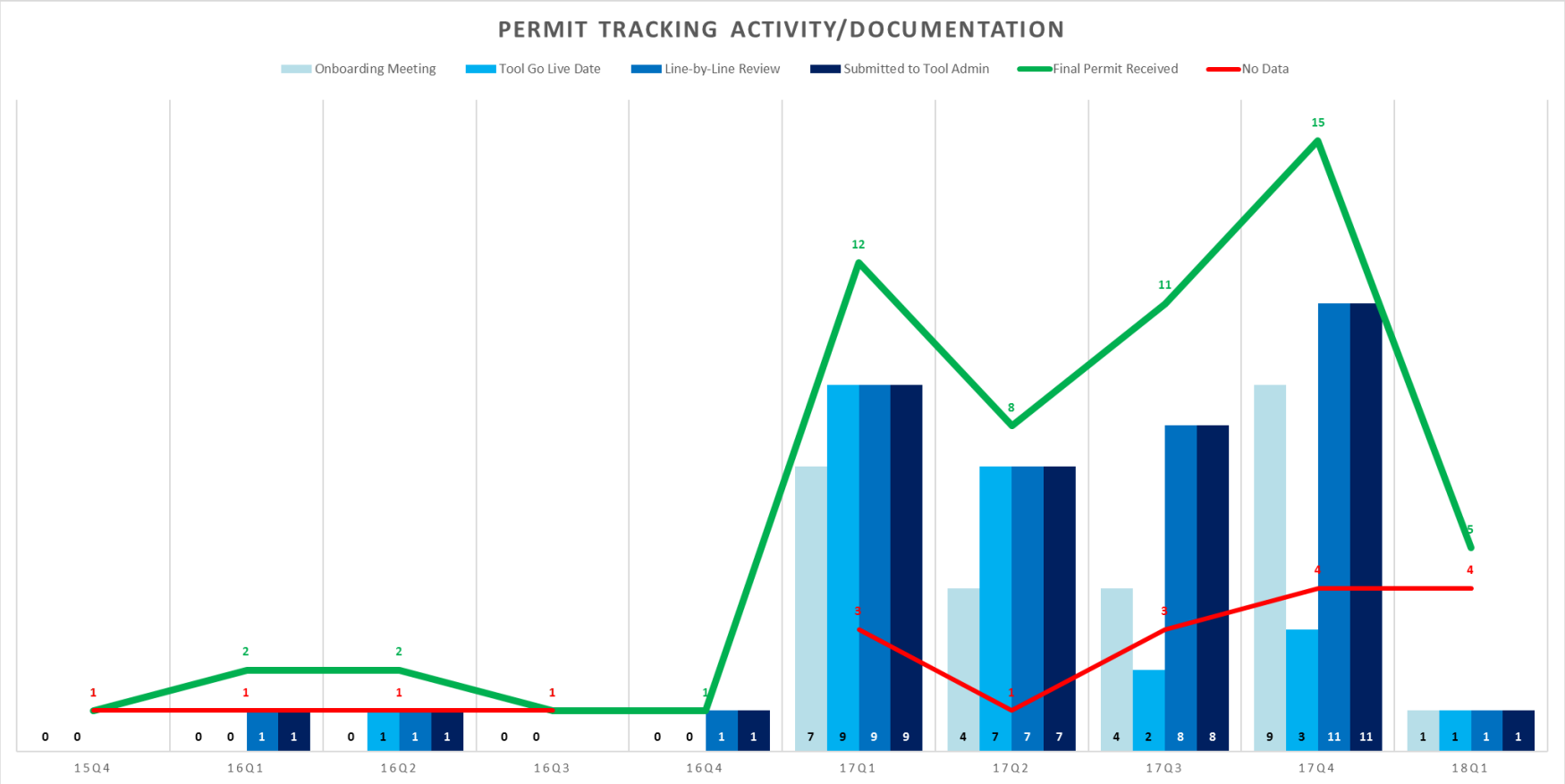
Permit Tracker – Example Power BI Dashboard



Permit Tracker Dashboard



Permit Tracker – Example Power BI Dashboard

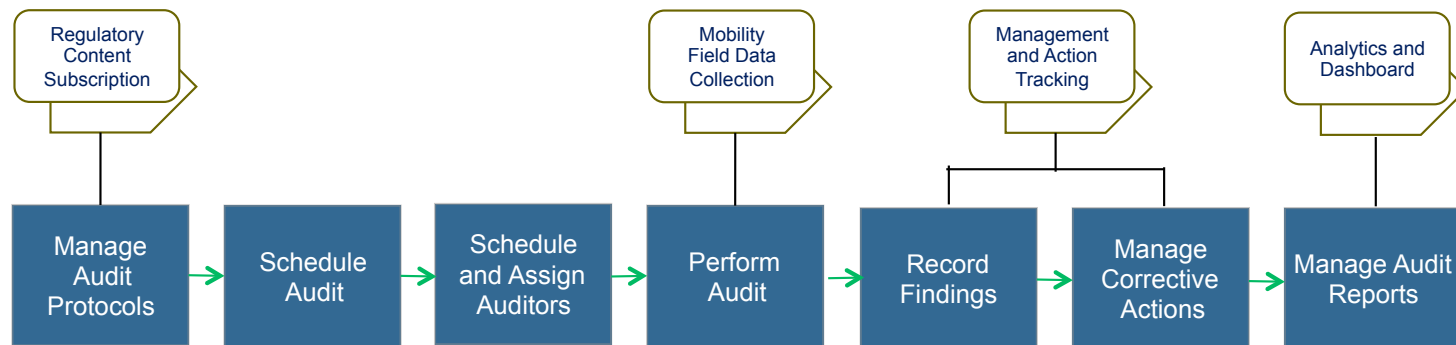


Audits

What is the process workflow?

How is data collected in the field?

Overview of Audit Program Workflow



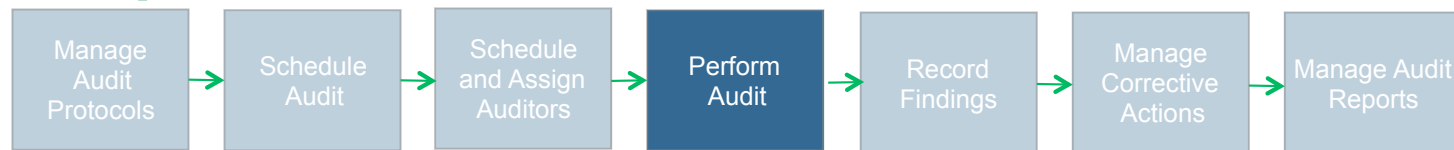
Name	Site	Project	Company	Audit Status	Scheduled Start Date	Progress
Regulatory Content Subscription	Various	Various	Various	In Progress	11/20/24	100%
Quality Assurance	Various	Various	Various	Completed	10/15/24	100%
Health & Safety	Various	Various	Various	Completed	10/15/24	100%
Environmental	Various	Various	Various	Completed	10/15/24	100%
Operational Excellence	Various	Various	Various	Completed	10/15/24	100%
Information Security	Various	Various	Various	Completed	10/15/24	100%
Business Process	Various	Various	Various	Completed	10/15/24	100%
Customer Satisfaction	Various	Various	Various	Completed	10/15/24	100%
Supply Chain	Various	Various	Various	Completed	10/15/24	100%



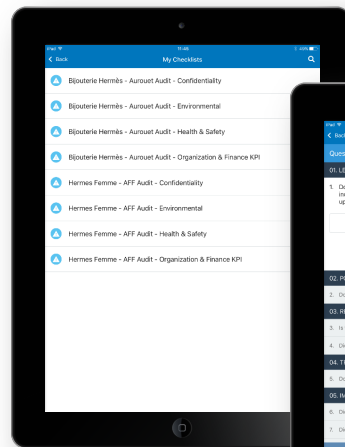
Record No.	Finding	Risk Rating	Recommendation
10	Violating agents should not attempt to supersede the scope of the engagement within the organization.	Low	Field the goals within the approved scope of the terms. This should be approved with appropriate contractual agreements throughout the business units.
15	External organizational help was not found to be a critical factor allowing the pilot studies to succeed.	VERY HIGH	Allow at least 50% of the field questions inside the Business Units to be answered by preference order.



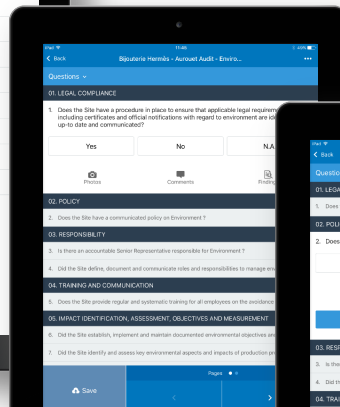
Mobile Capture of Audit Data in the Field



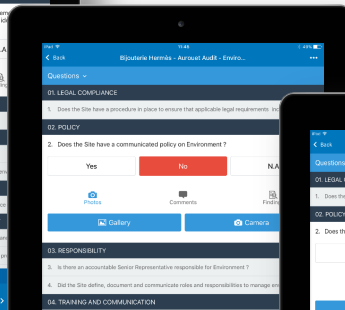
Audit Checklist



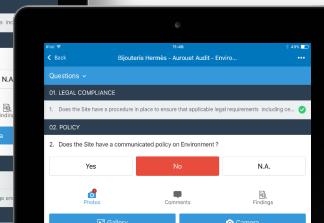
Audit Questions



Result / Finding

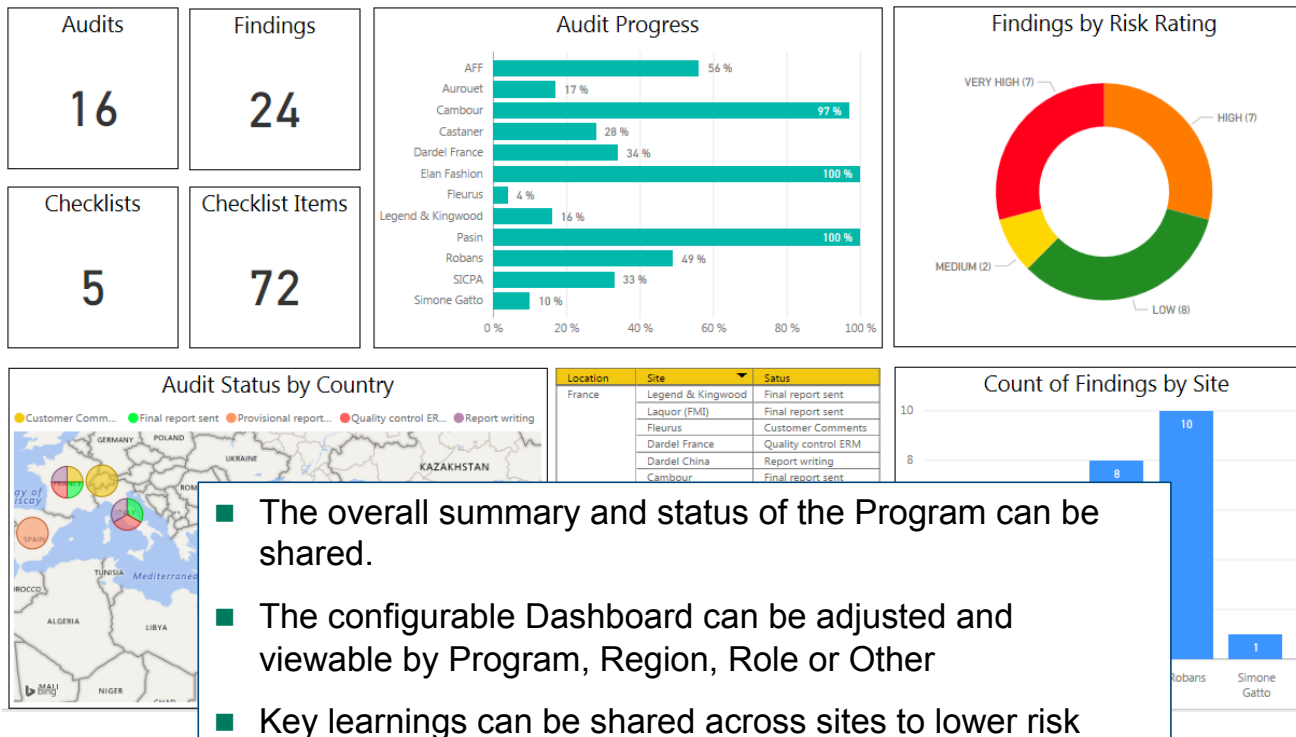
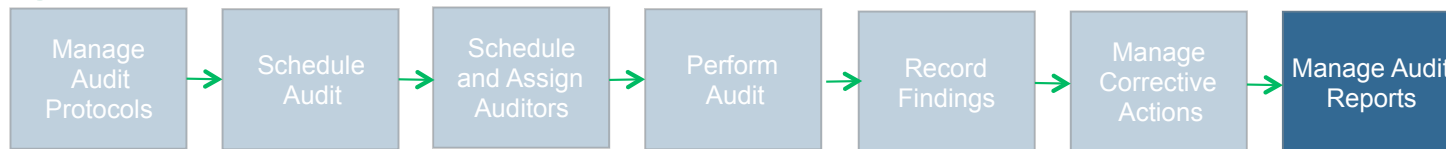


Evidence



- Integrated mobility solutions allow capture of audit results in the field
- Real-time capture of results and supporting information (e.g., photos)

Findings are Recorded & Tracked to Closure



Data Analytics

What are data analytics?

How are these used for compliance reporting?

What are 'Data Analytics'?

Prescriptive analytics

Quantifies the effect of future decisions. This is about recommendations/prescriptions on specific actions that need to be taken to meet the objective.

Predictive analytics

Helps to understand the future and provide actionable insights.

Diagnostic analytics

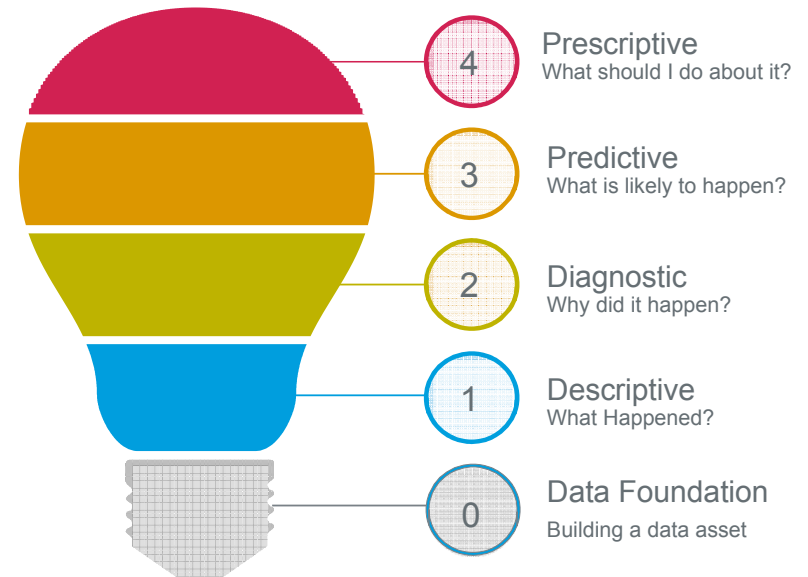
Identifies the causal drivers of observed effects. Diagnostic analytics capture the trends and patterns in the data and can help identify cause-effect relationships.

Descriptive analytics

Describes or summarizes raw data and makes it interpretable. Descriptive analytics applications include standard reports that used in decision making, visualizations through GIS (e.g., geospatial data), and bubble charts (through Power BI).

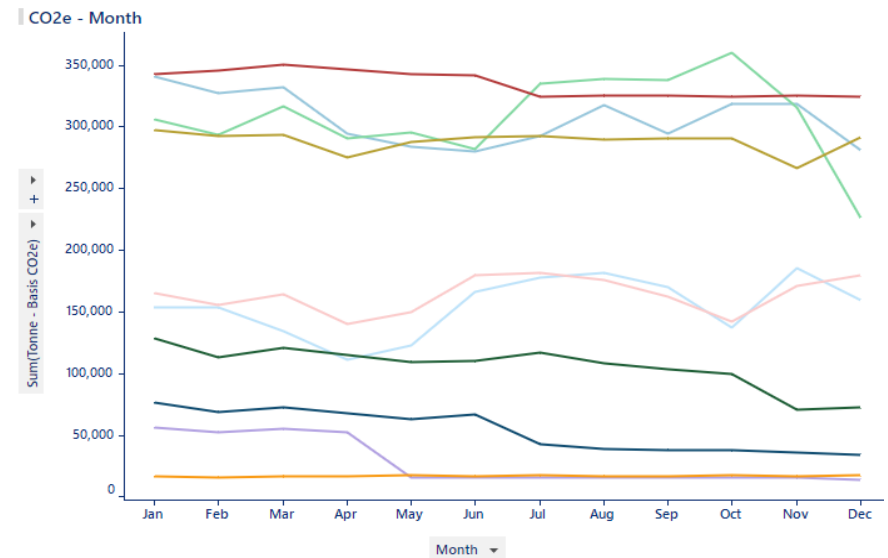
Data foundation

Getting your house in order. Understanding the data you have and the data you need to develop or acquire. Organizing the data and ensuring appropriate governance, data quality and data cleansing processes.

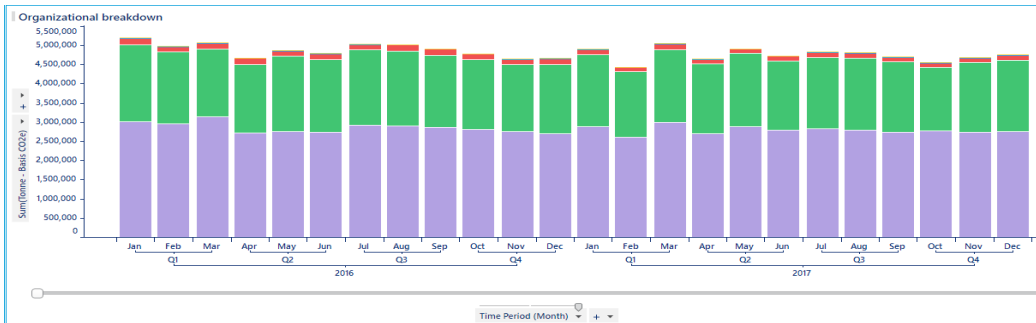


Descriptive Analytics - Corporate Greenhouse Gas (GHG) Metrics

- Annual GHG Corporate Report
- Aggregate at various levels of the operational hierarchy, along with rollup of variance comments when the emissions changed by a certain percentage year-over-year
- Utilized Spotfire to develop a dashboard to present the data visually combining tables and charts to allow the users to freely explore the GHG data and identify areas of improvement while catching outliers



Improved visualization and use of GHG emission data to gain insights on environmental performance and improve environmental data quality.



EMIS

How do I get started on evaluating my EMIS needs?

How do I get started on evaluating my EMIS needs?

Start to
Define

Refine
Under-
standing

Share &
Align

Think
Next

Consult
Market

Decide

Vision and Validation

Determine the scope of the effort, the requirements for the IT system, the processes that the system will enable and the people that will collaborate through it.

Solution

Determine the “best fit” technology or technologies to augment your people and processes.

Perform Health Check on existing technologies and potential technology vendors.



Thank you

Stephanie Nicholson
Partner
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+1 615 614 8476
Nashville, Tennessee

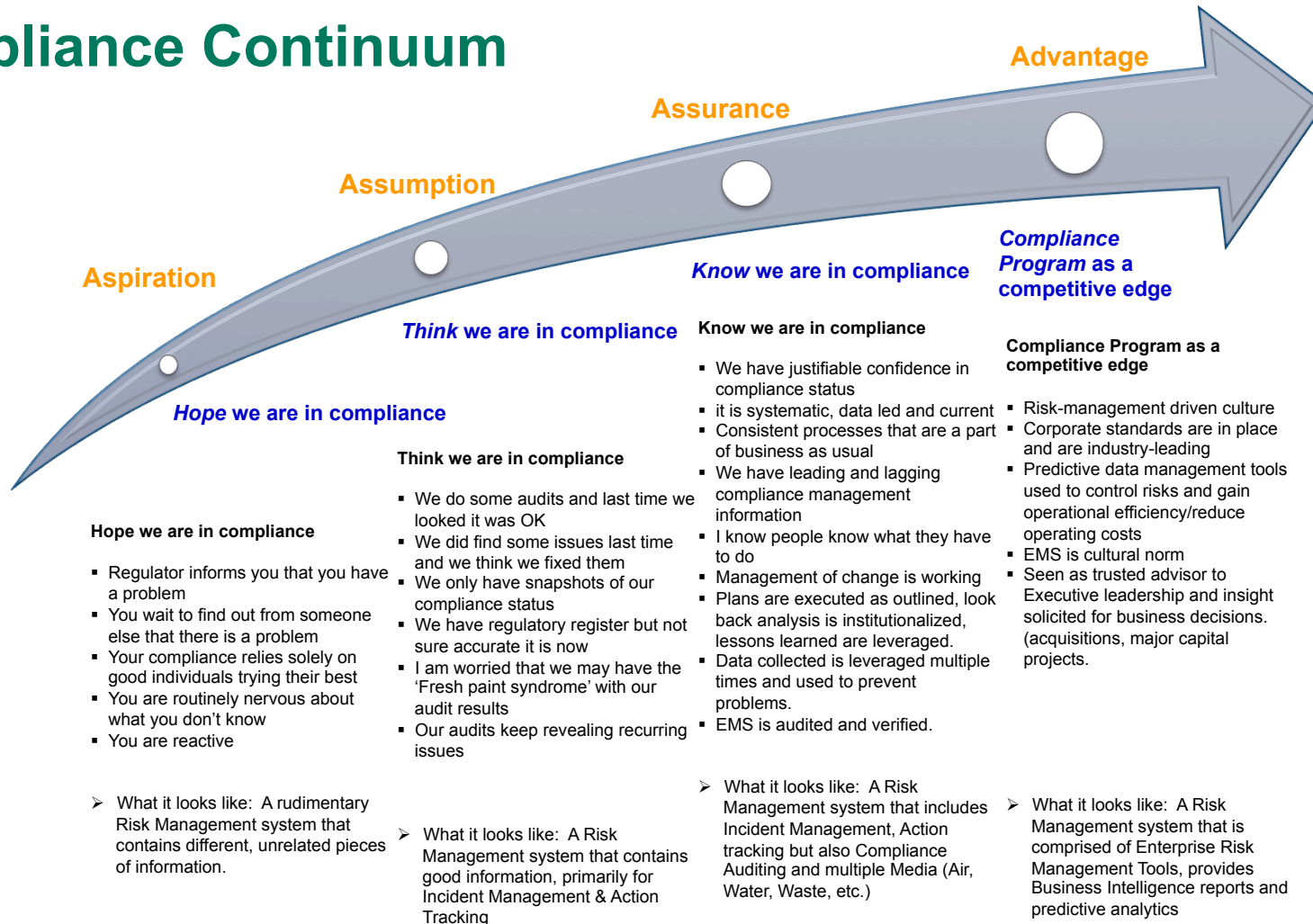


The business of sustainability

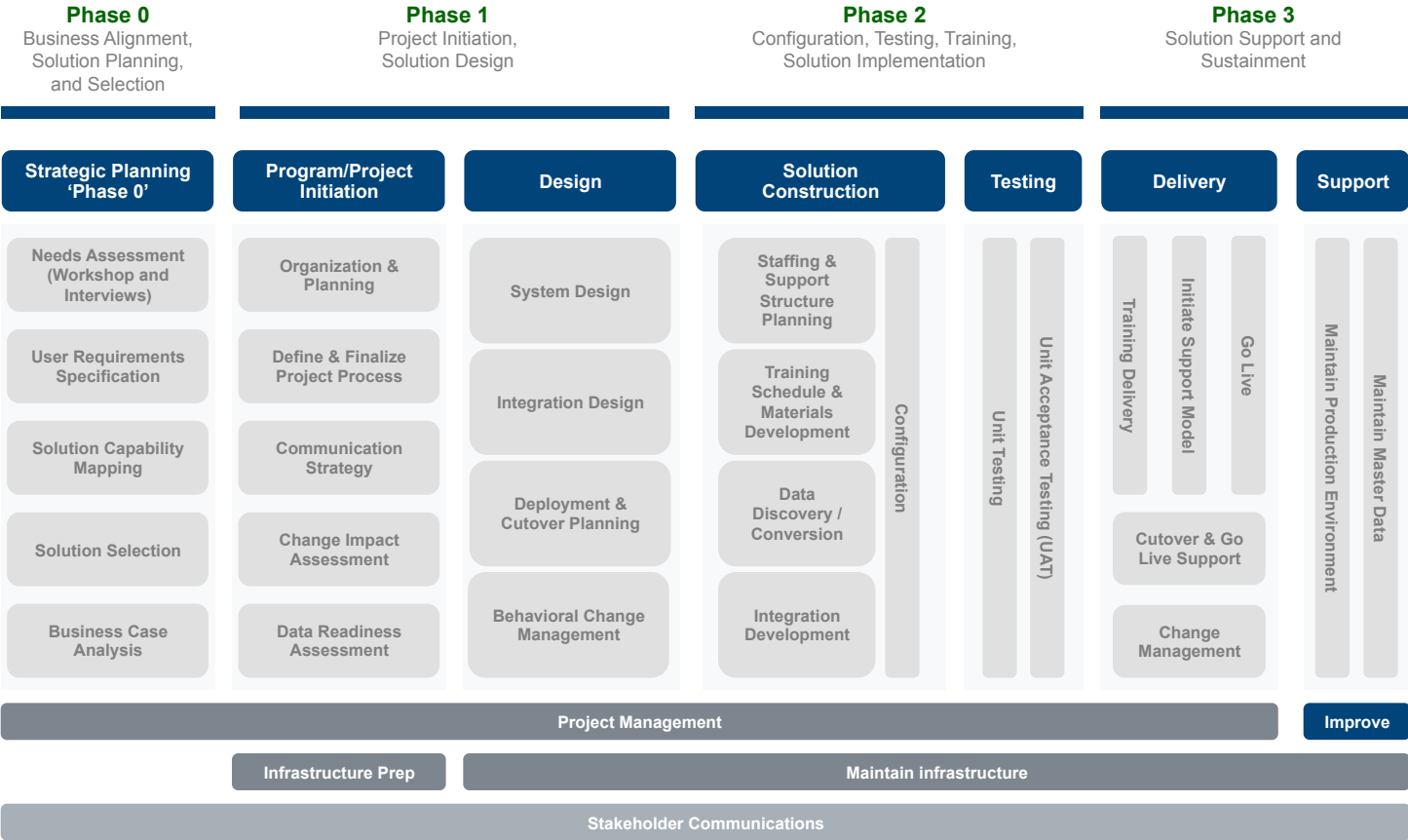


REFERENCE SLIDES

Compliance Continuum



Enterprise HSE Solutions Methodology



Sprints of activity

