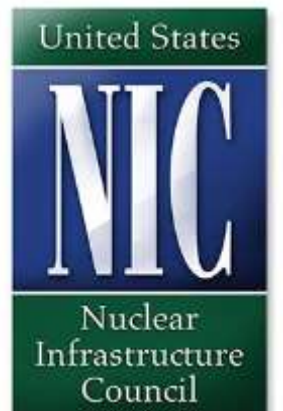


US Advanced Manufacturing and Nuclear Supply Chain Industry Overview

US NIC/ETEC Nuclear Supplier Workshop
September 6, 2017
Oak Ridge, TN

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Objectives

- Highlight Role of the US Nuclear Infrastructure Council Manufacturing and Supply Chain Working Group
- Describe Participants, Meetings and Activities
- Provide an overview of the Strategic Planning Process
- Highlight of M&SC WG Projects
- Address Plans for the Future

Roles and Capabilities of the NIC M&SC Working Group

- Identify generic business issues to be resolved for mutual benefit of the Members
- Implement projects and create reports in areas of interest
- Identify Lessons Learned
- Conduct Nuclear Benchmarking
- Support development of consensus standards
- Support development of workshops
- Support development of Regional Supply Chain Networks

Manufacturing and Supply Chain Working Group

- Co-Chairs:
 - Brad Dunkin, Consultant, Vigor (HQ: Oregon), Fabricator
 - David Garcia, Jr. – President – American Mergers and Manufacturing International (HQ: Minnesota)- Supply Chain Aggregator
 - Chris Martoglio – COO /Founder – Blue Burro Technologies (HQ: Indiana/California)
Technology/Procurement/Contracts Management
- NIC Project work began in 2014
- Full slate of activities in 2016-Present
- M&SC WG List = 65 participants from 35 member companies

2017 Activities - Meetings

- M&SC WG Meets normally on the day after the quarterly NIC member meetings
- Meetings may be in person but are generally done by conference call
- Items covered
 - Industry current events
 - Project discussions
 - Member input
- Long Term Planning guided by a Strategic Plan
- Annual Activities tracked by use of a Tactical Plan

2017 Activities

- Publication of Advanced Manufacturing Vision Project Report- February 2017
- Start of next project- NIC Advanced Reactor Road Maps, May 2017
- NIC / Concurrent Technologies Corporation Nuclear Supplier Workshop August 23-24, 2017
- NIC Mission to Ontario, Canada August 27-September 1, 2017
- **NIC/East Tennessee Economic Council Nuclear Supplier Workshop September 6-7, 2017 Oak Ridge, TN**
- NIC / DOE Advanced Manufacturing Workshops, Idaho Falls, ID October 3-5, 2017 (NIC Oct 3-4, DOE Oct 4-5)
- UK/NIC Meeting at British Embassy, Washington, DC September 14, 2017
- NIC Mission to the United Kingdom, October 22-27, 2017
- Nuclear Energy Insider Digital Workshop, Charlotte, NC, November 13-14, 2017

Rev 2 1-31-16	2016	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17
Meetings															
Strategic Plan		Strategic Plan	Tactical Plan												
NIC Meetings				February 02		April 19		June 7-8			September 20			December 05	
M&SC Working Group Meetings				February 03		April 20		June 09			September 21			December 06	
														December 07	
M&SC Policy White Paper			Draft	Issue									Update		
M&SC Communications Streaming (One item/10 days)			issue beginning 2/1/16												
Supply Chain Mini-Summit after Nuc Energy Insider Conference												(TBD)	(TBD)		
Projects		Set schedules		Set schedules											
Set Up members-Only Web Area at http://www.usnic.org										Modify Web site	Post Reports and White Papers	Develop advertizing/commu		Post Reports and White Papers	Post Reports and White Papers
Complete SMR Mapping Phase I (NIC/ANS) Vince Gilbert		Expand Model Data Base													
SMR Mapping Phase II (NIC/ANS) Vince Gilbert															
	Phase IIA- DAT	Update DAT													
	Phase IIB - EBT	Hold until 2017													
Advanced Manufacturing Vision			3-Feb												
Collaborative Tools for Projects		Phase I and BOX													
Advanced Manufacturing Vision					Phase II	20-Apr									
						Phase III	9-Jun								
		Phase IV							Phase IV	21-Sep					
												Conduct Next Steps Assessment		7-Dec	
		(NIC has DRAFT FINAL NEI Guide)													
SMR In-Factory ITAAC (US DOE) -ON HOLD															
Member Activities															
Industry Workshops															
Advanced Reactor Summit			Summit II February 9-11, Oak Ridge, TN												
Waste Management Symposium 2016					March 6-10 Phoenix										
Nuclear Energy Insider/NIC SMR/AR Workshop						April 14-15 Atlanta									
ACI-NIC Advanced Nuclear Manufacturing and Supply Chain						TBD									
US Dept of Commerce 810 Workshop	TBD														
ANS Utility Working Conference										August 14-17 Amelia Island					
Decision Makers Forum													Nov 1-3 Wash, DC		
NRC/DOE Non-LWR Licensing Workshop								TBD Rockville, MD							
ANS Winter Meeting													November 6-10 Las Vegas, NV		
Nuc Energy Insider/NIC Multi-topic Conferences												O&M TBD			
NIC Regional Training Workshops															
Supplier NQA Success Path (AMMI-invited)															
Reactor Technologies Overview Workshop															
Nuclear Safety Culture (Vijay Nilekani-OBEI Inc)		Ready for pilot													
Reverse Engineering (Roy Shepperd-EIO-program input invited)					Develop										
Web Apps/Collaboration Tools Overview (Chris Martoglio-Blue Burro)						Develop									
Collaborative Tools for Projects (Chris Martoglio-Blue Burro)									Pilot						
Supply Chain Mapping Portfolio (Vince Gilbert)															
						NuScale	Westinghouse	(X-Energy)	(NGNP)	(TerraPower)	(Terrestrial Energy)				
Regional Energy Supply Chain Networks (to be developed)	Draft Priority														
Charlotte (Carolina Cluster)	7														
Idaho/Washington (CAES/Bannock Development)	3		in progress												
Minnesota plus 4 (AMMI) Minneapolis	1														
Missouri plus 4 (MO Economic Development) St. Louis	2														
Ohio/Western PA/West Virginia (EIO) Cleveland	5														
Tennessee/Alabama (ETNUA Corridor) Oak Ridge	4														
Texas/Oklahoma	8														
South Carolina (NuHub) Columbia, SC	6														
Virginia /MD/DE Eastern PA (VA Nuclear Commission) Richmond, VA	7														
Florida/GA (TBD) Atlanta, GA	9														
Site Visits	Schedule Sites														
	TBD														

2016

Key Activity Descriptions

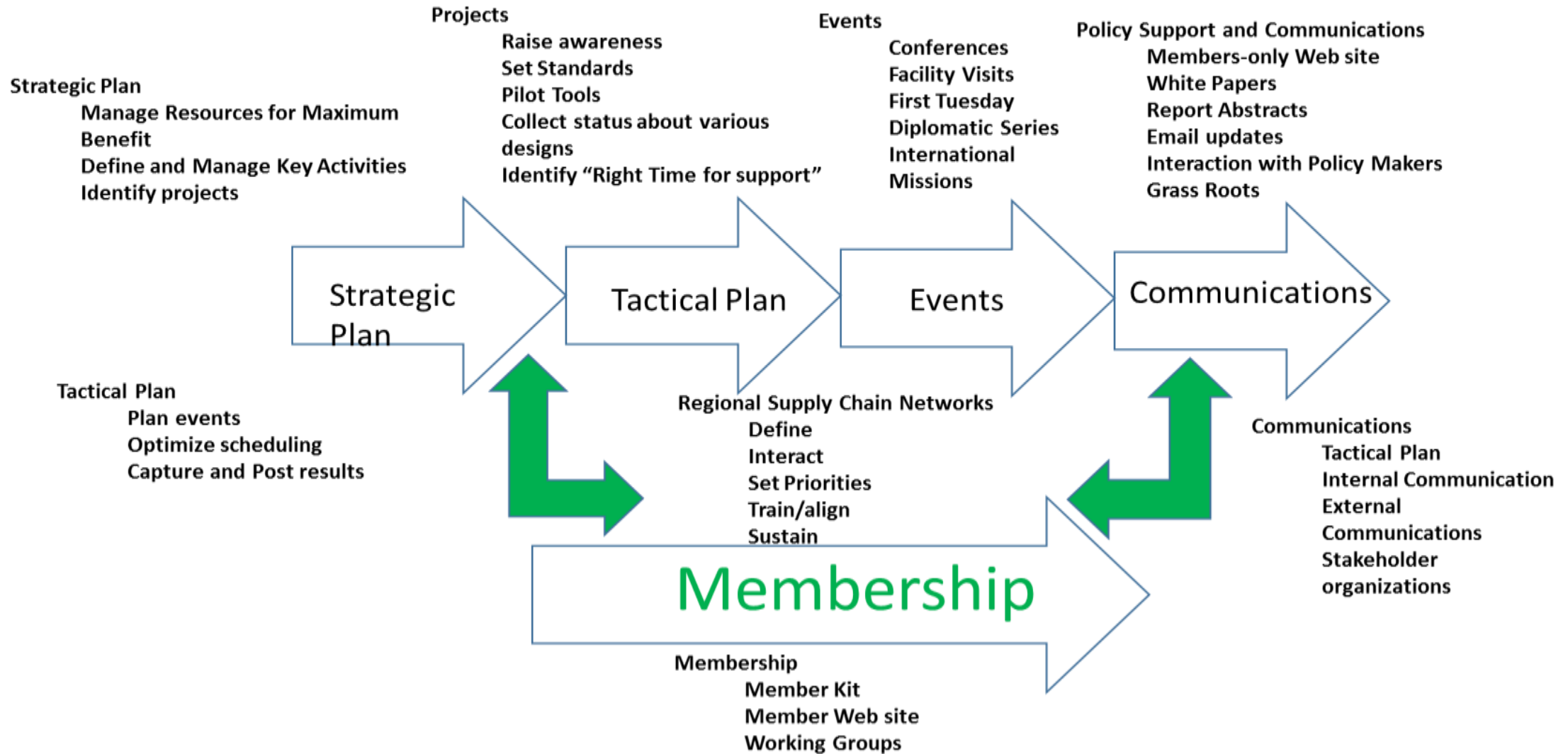
- Members
- Policy
- Working Groups
- Reactor Road Maps
- Suppliers
- Projects
- Services and Communications
- Licensing
- Sites
- Supply Chain Mapping
- Regional Supply Chain Networks
- Reactor Development Support
- Economic Value

NIC M&SC Strategic Plan



Coping with Scarce Resources....

US NIC Manufacturing & Supply Chain Working Group Key Activities



SIPOC Model

- A traditional process modeling approach specifying inputs, outputs and a process for producing desired outputs
- A basis for illustrating process performance measures

SIPOC Model Basis

PROCESS:
SUB-PROCESS:
ACTIVITY:

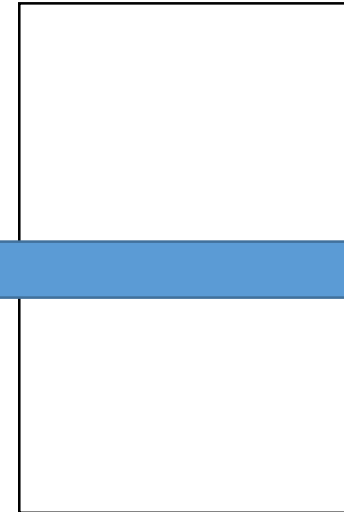
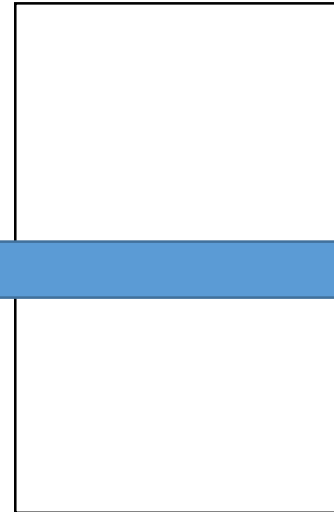
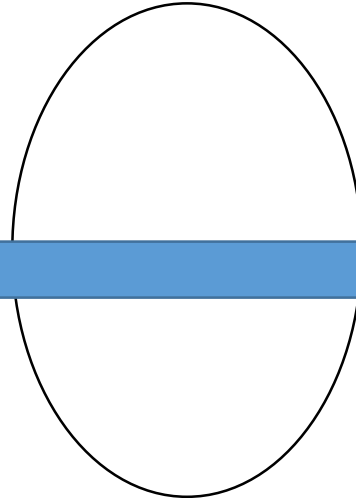
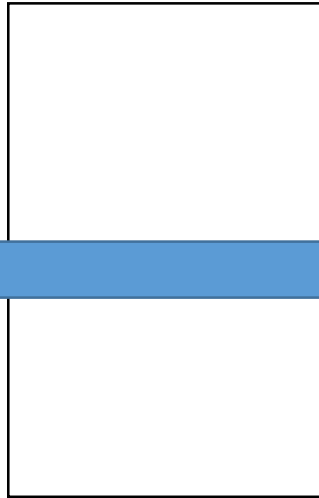
Process
Key
ACTIVITIES

**CUSTOMERS/
CLIENTS**

SUPPLIERS

INPUTS

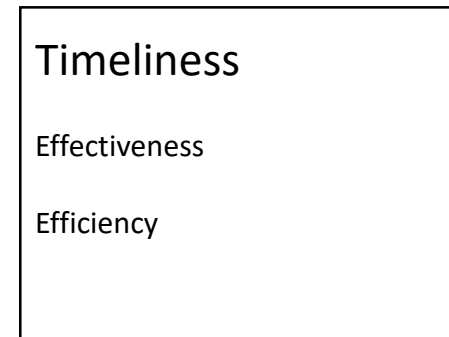
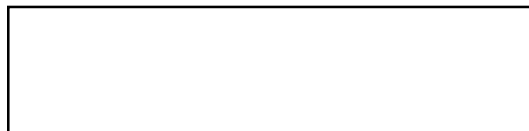
OUTPUTS



TASKS

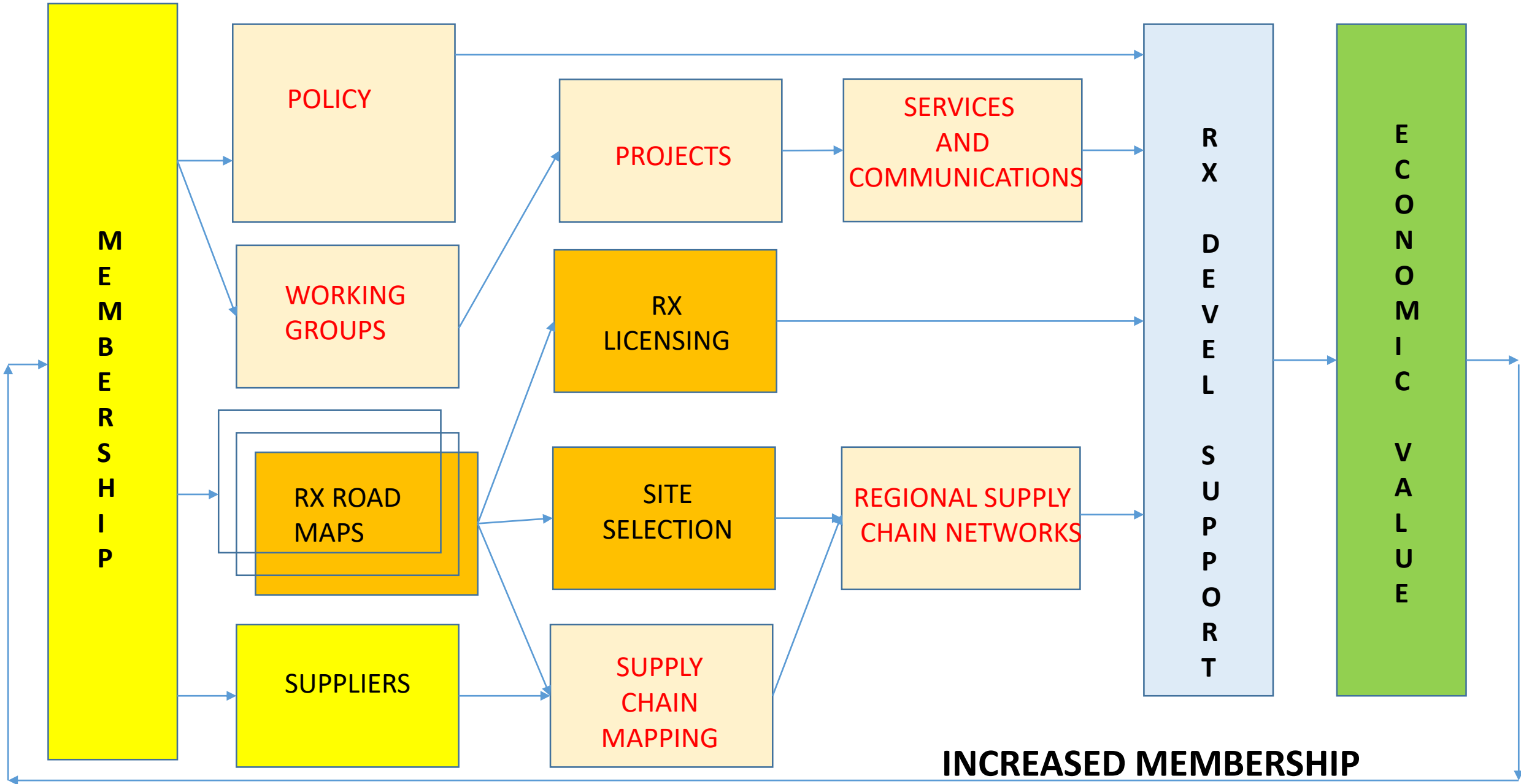
MEASURES

PROCESS OWNER



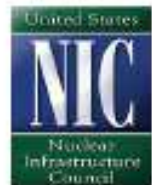
M&SC WG Process

NIC M&SC WG FOCUS



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**U.S. Nuclear
Infrastructure Council
Supply Chain Mapping
Project**



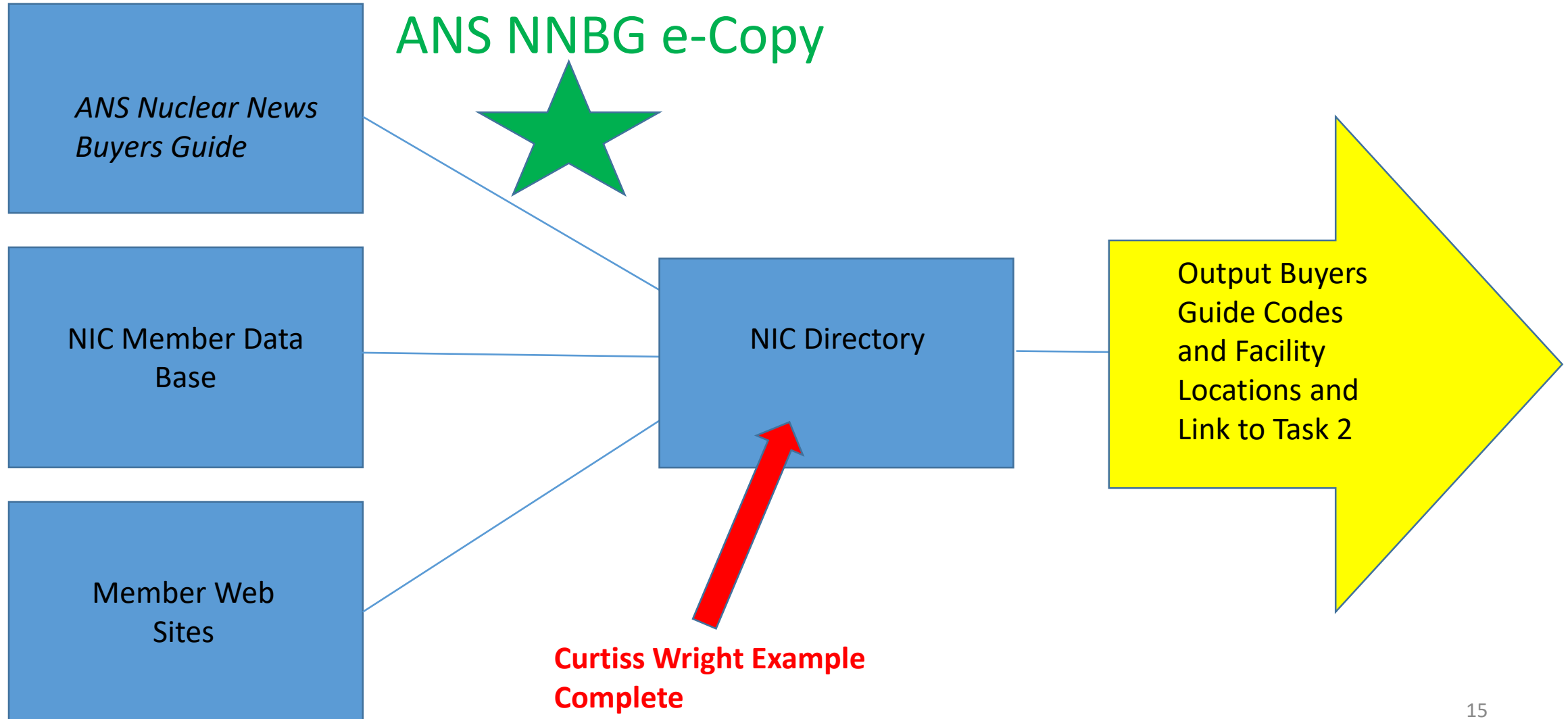
**Developed Stick Built
Supply Chain Map of
NuScale SMR**

**Developed Modular
Supply Chain Model of
the Westinghouse SMR**

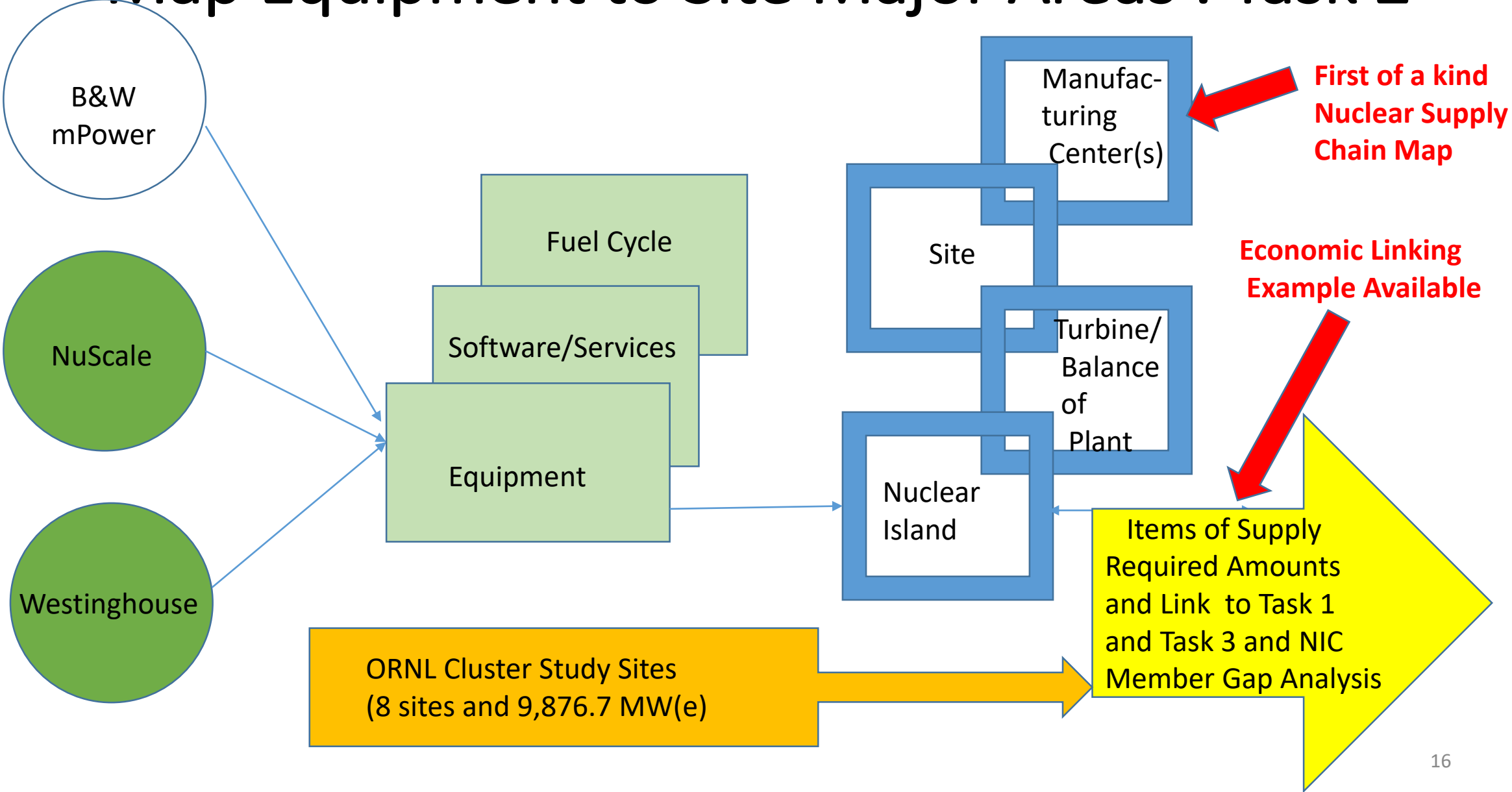
**Estimated Quantities of
Key Equipment,
Components and
Materials**

**Identified Economic
Value Models for
estimates prior to and
during construction**

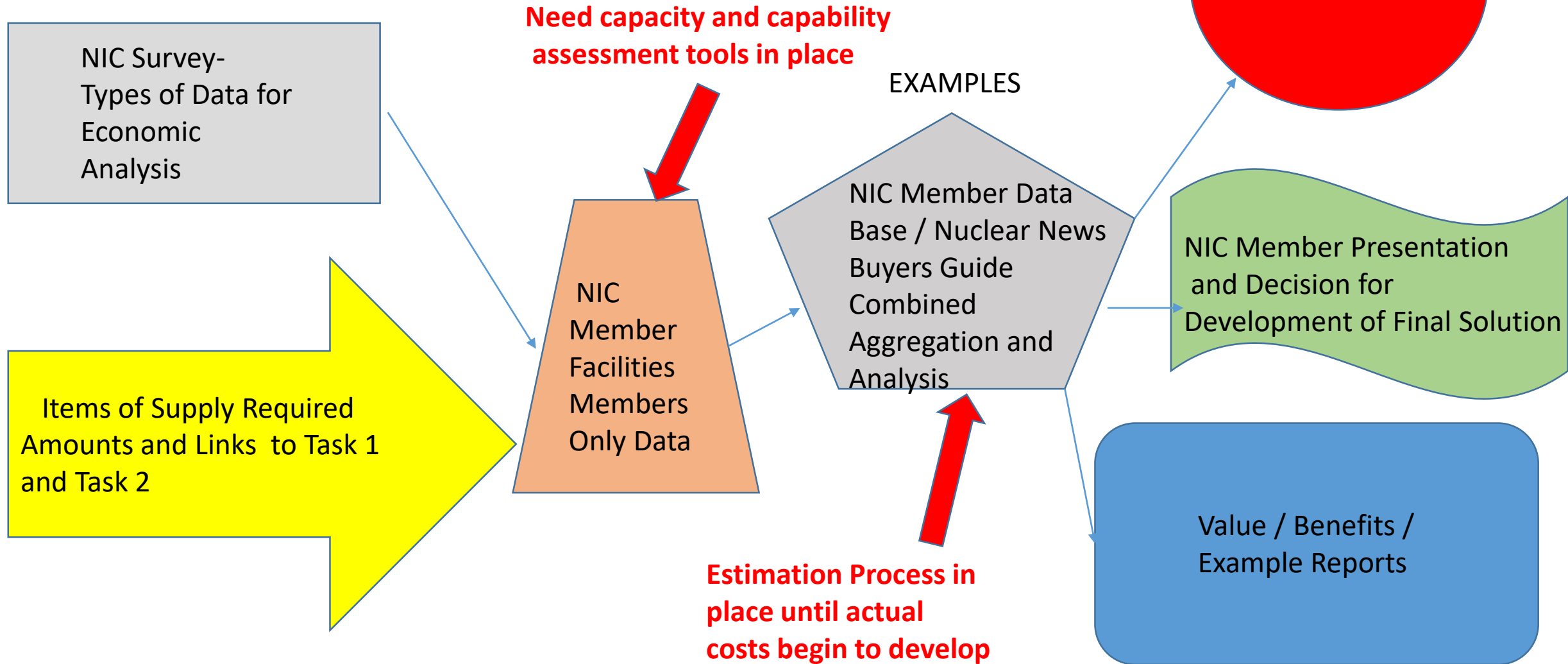
Members Directory: Task 1



Map Equipment to Site Major Areas : Task 2



Assess Economic Benefit and Capacity: Task 3

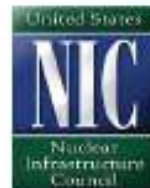


Supply Chain Development

- Via Supply Chain Mapping
 - **Compile** lists of supplier capabilities
 - **Align** equipment model components and capabilities to suppliers
 - **Assess** demand and capacity
 - **Get new suppliers started** on “The Journey”
 - **Support Members** to assess consortia opportunities

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**U.S. Nuclear
Infrastructure Council
Advanced Manufacturing
Vision Project**



Developed a standard advanced manufacturing glossary of terms

Developed standard categories and sub-categories of advanced manufacturing capabilities

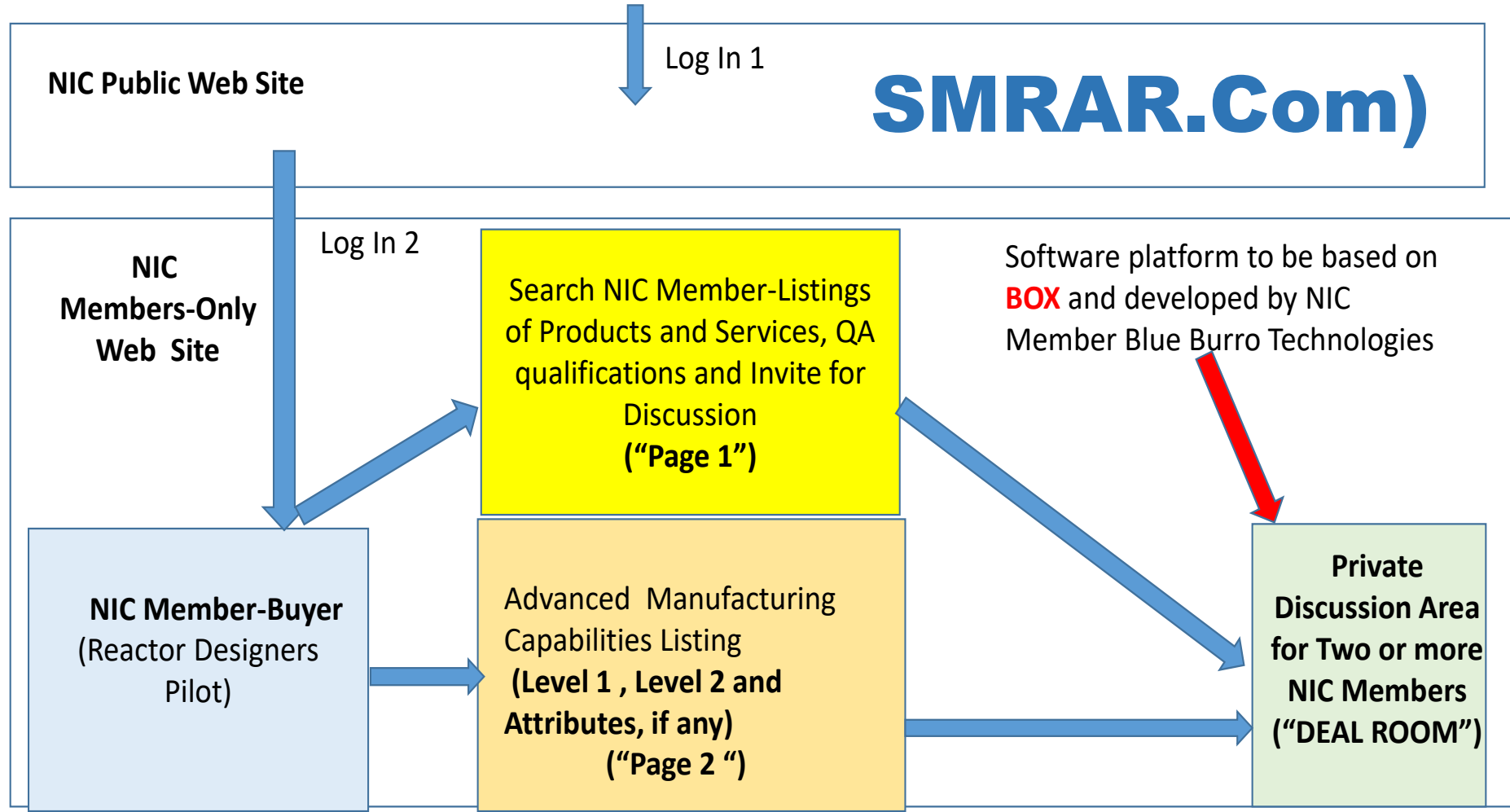
Adopted a “Deal Room” concept for a precise, confidential Buy-Sell Network to support advanced manufacturing services (SMRAR.Com)

Evaluated and adopted a US DOE concept for creation of a Virtual Nuclear Advanced Manufacturing Research Center that could be used by all US Reactor Designers (CANM)

Advanced Manufacturing Capabilities

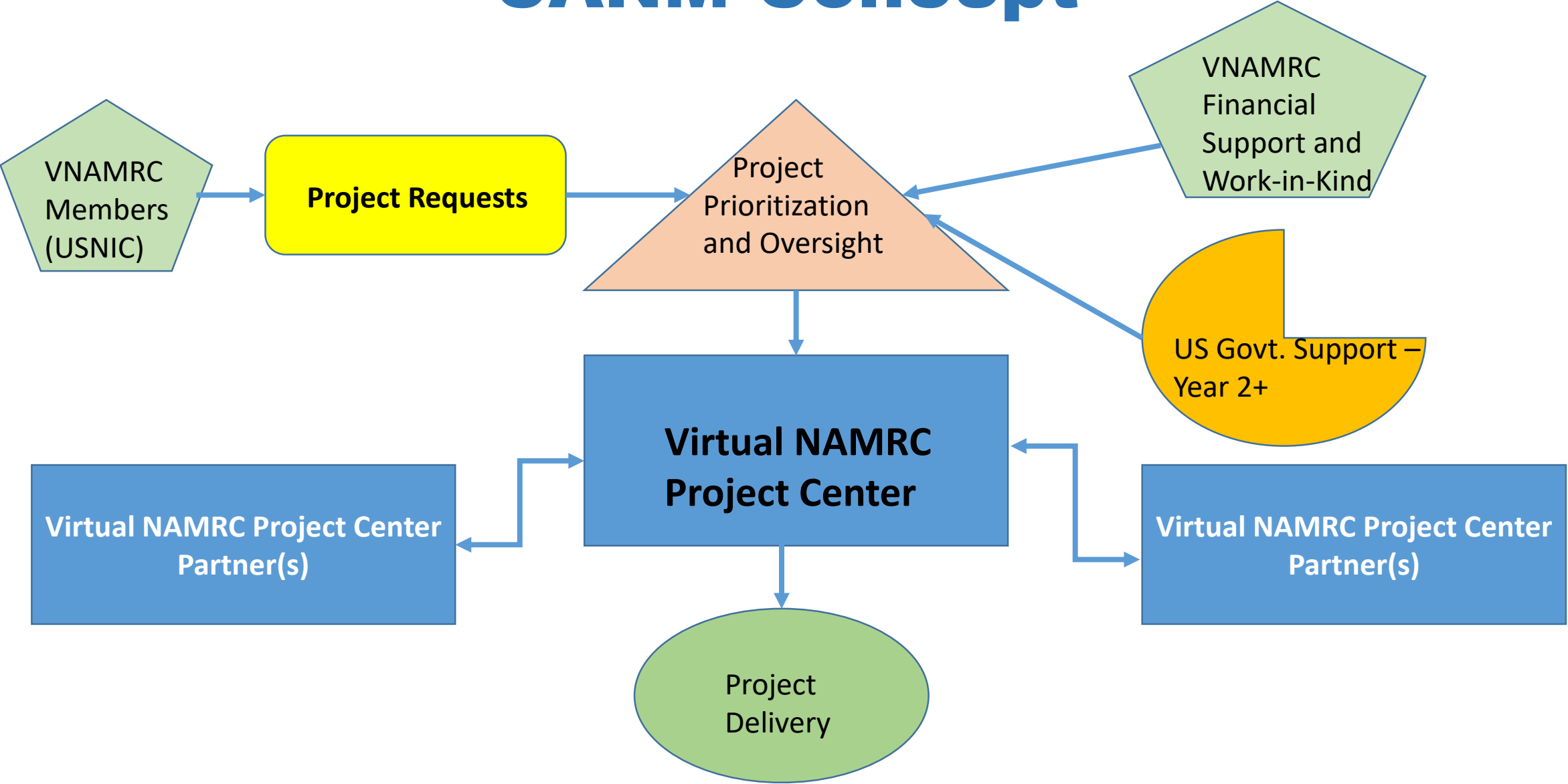
- Additive Manufacturing
- Casting
- Concrete Materials and Rebar Innovations
- Design for Manufacturing
- Forging and Forming
- Hot Isostatic Press
- Metrology and Inspection
- Machining
- Materials: Composites
- Modular Fabrication
- Surface Modification and Cladding Processes
- Visualization
- Welding and Joining

NIC Advanced Manufacturing Capabilities Private Discussion Tool Pilot “Deal Room”



Software platform to be based on **BOX** and developed by NIC Member Blue Burro Technologies

CANM Concept



In Progress : Advanced Reactor Road Maps Project (2017)

- Development of a Road Map would provide steps in the following major topical areas:
- Business Objectives needed in the time period 2018-2030
 - Finance
 - Project Schedule (generic timeline with major milestones)
 - Feasibility Studies
 - Early Staffing
 - Workforce Plan
 - Intellectual Property Rights
 - Identify ongoing R&D relevant to each design
 - Identify international consortia and expectations for use

Major Topical Areas

- Design Validation
- Licensing Process
- Fuel Cycle
- Supply Chain Development
- Construction Project

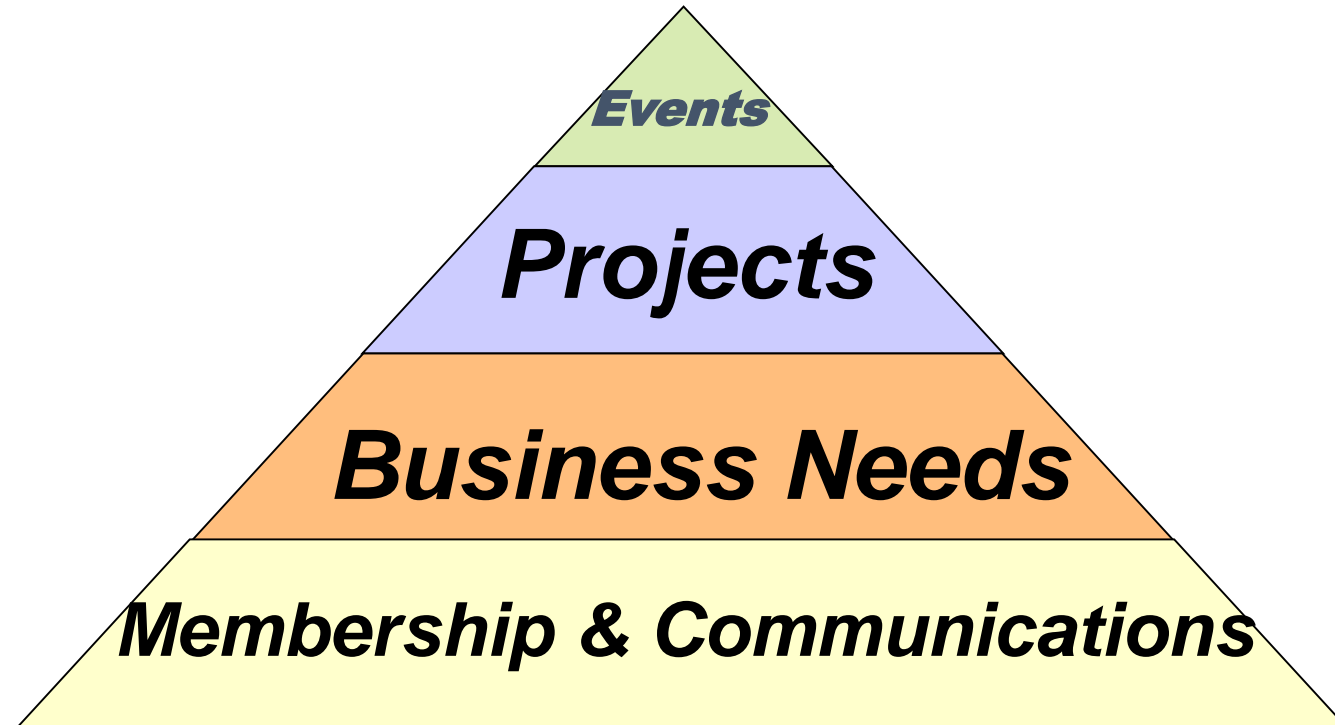
Estimated Tasks -200

M&SC WG Future Plans (2018)

- Address priority AR Road Map Gaps
- Continue adding to SMR/AR Supply Chain Library of designs
- Continue development of Regional Supply Chain Networks
- Provide Outreach to NIC affiliates in Canada and the United Kingdom
- Continue Growing the Membership and Members-Only Services

US Nuclear Infrastructure Council

Summary



Membership and Business Needs Drives the Organization

How You Can Help...

Join the US Nuclear Infrastructure Council
- Lets Make it Happen !

Questions?

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