METHANOL INSTITUTE

Methanol Safe Handling & Poison Prevention

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Director of Government & Public Affairs -- Asia Pacific/Middle East

Methanol Safety Presentation

December 2016

Contents

01 ABOUT MI

History

- The Methanol Institute (MI) was first formed in 1989 to represent US methanol producers in Washington.

- 27 years later, MI is truly a global trade association supporting the expansion of the methanol industry in every corner of the world from offices in:

Singapore | Washington | Brussels | Beijing

OUR 2016 MEMBERS

methanex
the power of agility

MHTL
METHANOL HOLDINGS (TRINIDAD) LTD.

سابك
sabic

ATLANTIC METHANOL

Mitsubishi Gas Chemical America, Inc

MITSUI & CO.

OCI

شركة عمان للميثانول ش.م.م.
Oman Methanol Company L.L.C.

PETRONAS

كفاك
QAFAC

bp

شركة صلالة للميثانول ش.م.م. (المنطقة الحرة)
Salalah Methanol Company L.L.C. (SFZ)

GX
G2XENERGY

JM
Johnson Matthey
Catalysts

سبكيم
Sipchem

METOR

Eni
GROUP

Ecofuel

Mitsubishi International Corporation

METAFRAX

CARBON RECYCLING INTERNATIONAL

MOL
Mitsui O.S.K. Lines

FiTech

HELM

FUEL FREEDOM FOUNDATION
CHEAPER. CLEANER. AMERICAN-MADE.

IMTT
INTERNATIONAL-MATEX TANK TERMINALS

oberon
FUELS

VITUSA PRODUCTS™
INCORPORATED

Double Green Bridge
NW INNOVATION WORKS

azelis

Oorja
Enabling Power

TRICON
ENERGY

Vitol

CoogeeEnergy

Enerkem

CLARIANT

solvadis

HALDOR TOPSØE

SCC SOUTHERN CHEMICAL CORPORATION

SCC DISTRIBUTION

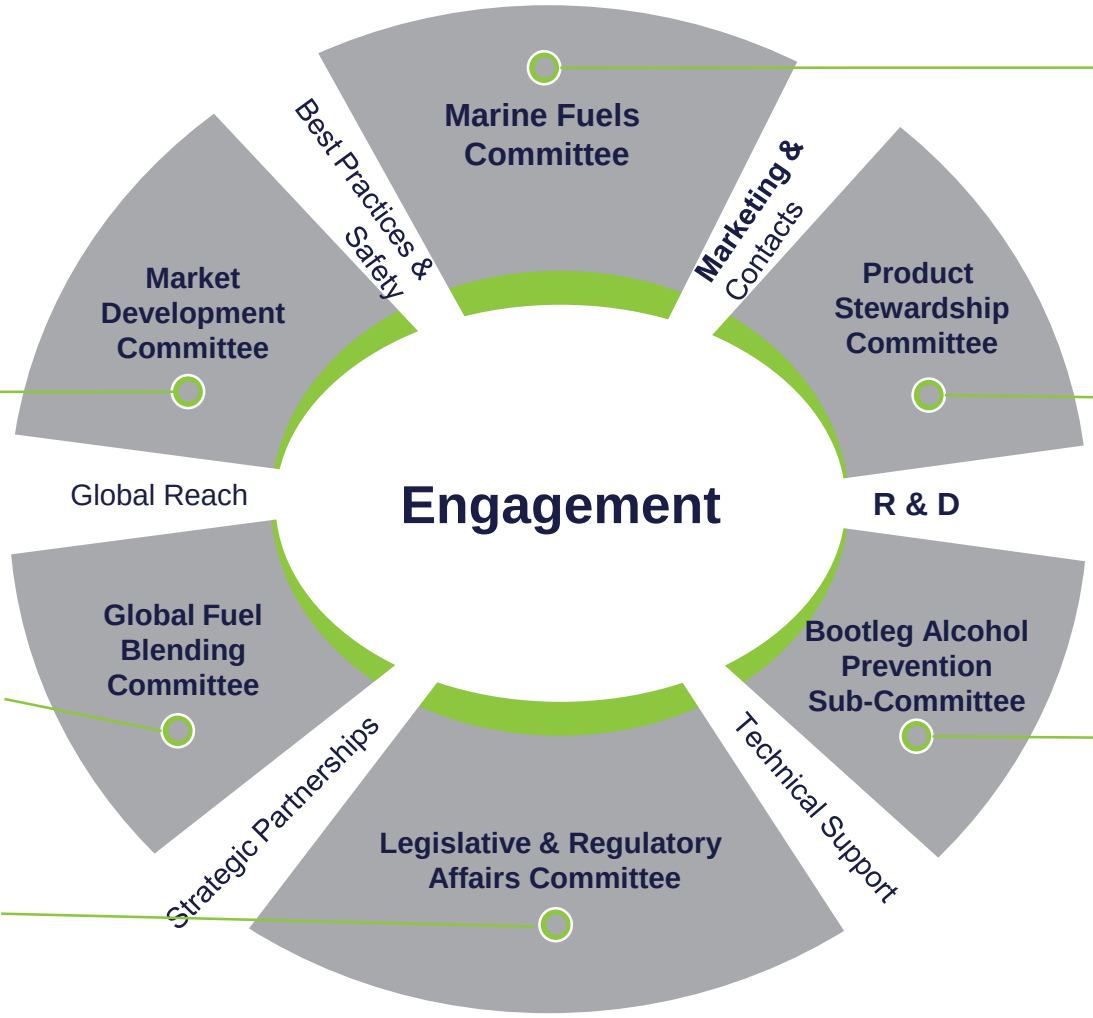
Billionmiles

LANXESS
Energizing Chemistry

MI STRATEGIC PARTNERS

- Asian Clean Fuels Association
- Bach Mai Hospital Poison Control Center
- China Nitrogen Fertilizer Industry Association
- Chinese Association of Alcohol & Clean Ether Fuels & Automobiles (CAAEFA)
- Gulf Petrochemicals and Chemicals Association (GPCA)
- Hanoi Medical University (HMU-IPMPH)
- International DME Association (IDA)
- International Methanol Producers & Consumers Association (IMPCA)
- LIAM Charitable Fund
- Peking University Center for New Global Energy Strategy Studies
- Tajikistan State Committee on Investment
- Uzkimyosanoat

Committee Structure



- Conversion technology
- Environmental
- Economics
- Advocacy

- Technical assistance
- Market research
- Development

- Safe Handling tools
- Health effects research
- Training

- Research
- Commerciality
- Specifications

- Awareness
- Education
- Prevention

- Bridging science to regulatory
- Public policy
- Derivative support

Product Stewardship

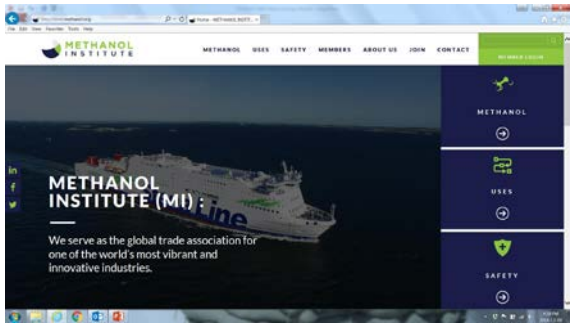
- Develop safe handling tools
- Organize methanol health effects research
- Provide training & guidance to emerging market leaders
- Bootleg (adulterated) alcohol prevention programs

Bootleg Alcohol Prevention

- Develop sustainable, global pilot program to prevent methanol poisonings
- Two current programs: Indonesia and Vietnam
- Community & Medical Education focus

MI Web Site

- **Central, global methanol hub:** www.methanol.org
- **Information & Resources** available for methanol buyers, consumers/general public, governments, media, etc.



Technical Bulletins

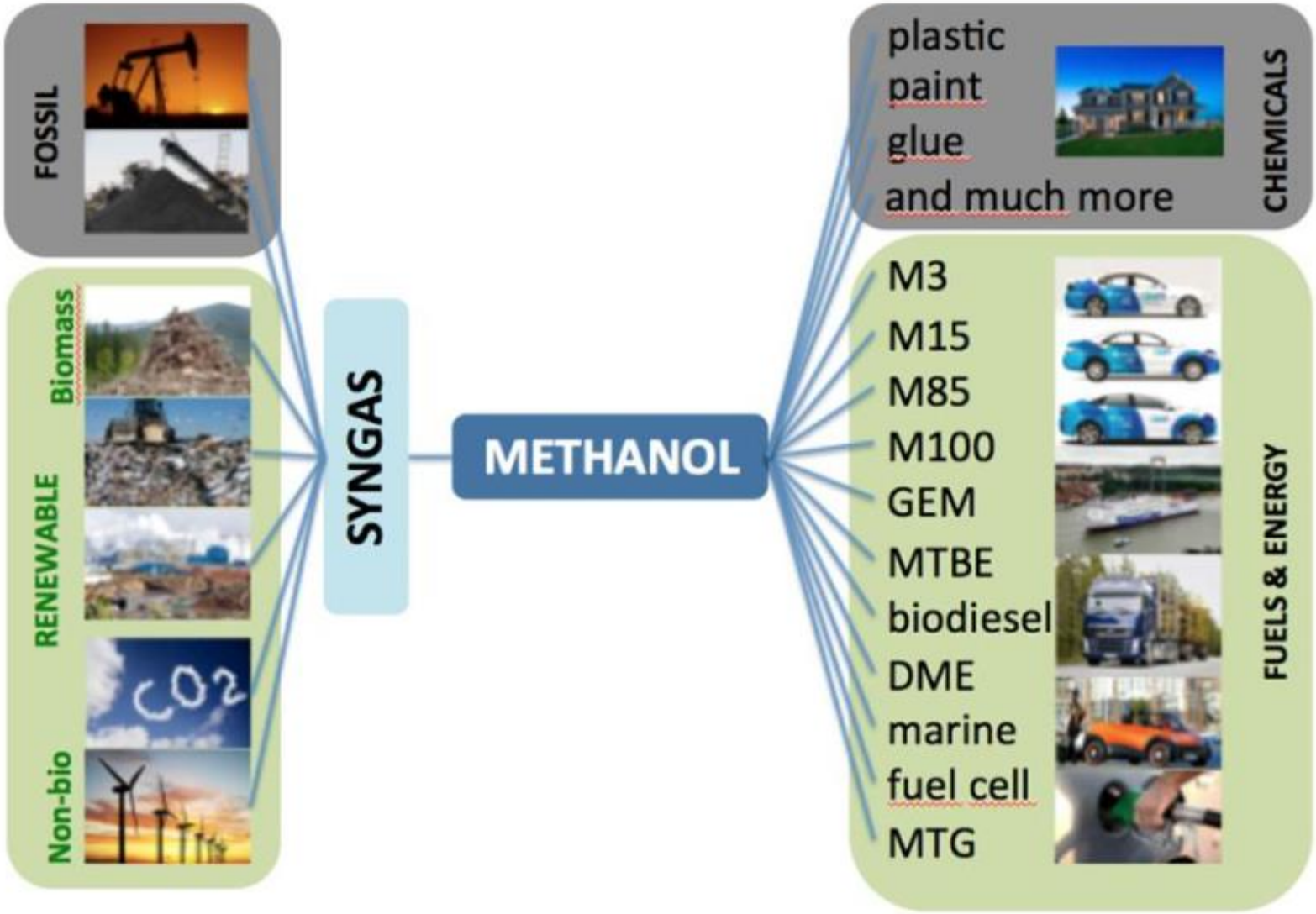
- **Communicates best practices to handle methanol at distribution points**

- **Technical information accessible (free)**

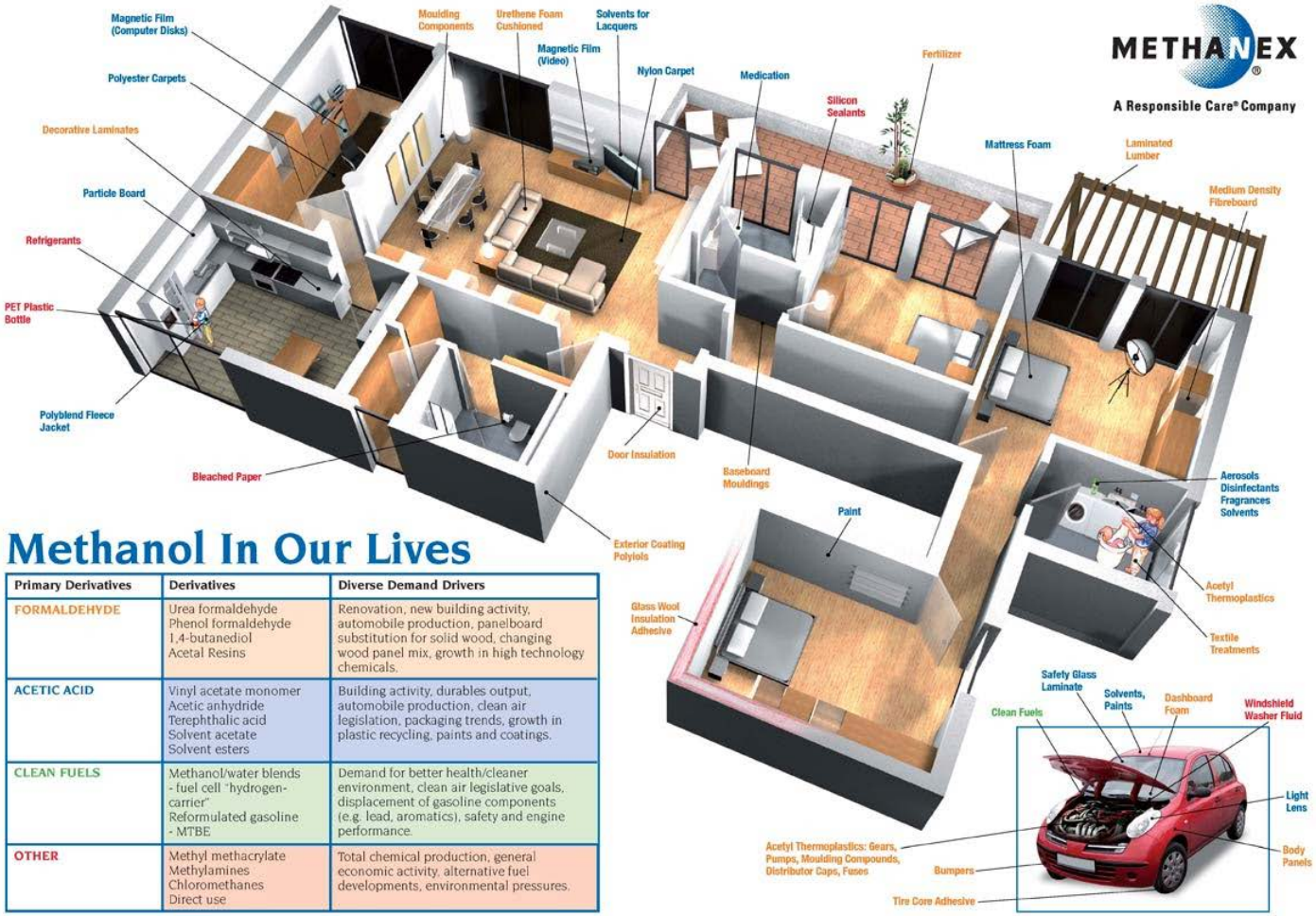
02 WHAT IS METHANOL?

Feedstock: Abundant/Sustainable

Market: Large/Diverse



Methanol: Essential Chemical Building Block



Methanol In Our Lives

Primary Derivatives	Derivatives	Diverse Demand Drivers
FORMALDEHYDE	Urea formaldehyde Phenol formaldehyde 1,4-butanediol Acetal Resins	Renovation, new building activity, automobile production, panelboard substitution for solid wood, changing wood panel mix, growth in high technology chemicals.
ACETIC ACID	Vinyl acetate monomer Acetic anhydride Terephthalic acid Solvent acetate Solvent esters	Building activity, durables output, automobile production, clean air legislation, packaging trends, growth in plastic recycling, paints and coatings.
CLEAN FUELS	Methanol/water blends - fuel cell "hydrogen-carrier" Reformulated gasoline - MTBE	Demand for better health/cleaner environment, clean air legislative goals, displacement of gasoline components (e.g. lead, aromatics), safety and engine performance.
OTHER	Methyl methacrylate Methylamines Chloromethanes Direct use	Total chemical production, general economic activity, alternative fuel developments, environmental pressures.

Where is Methanol Produced?

- **2016: 115 MMT** global capacity; **74 MMT** forecasted demand
- **2021**: **135 MMT** global capacity; **97 MMT** forecasted demand

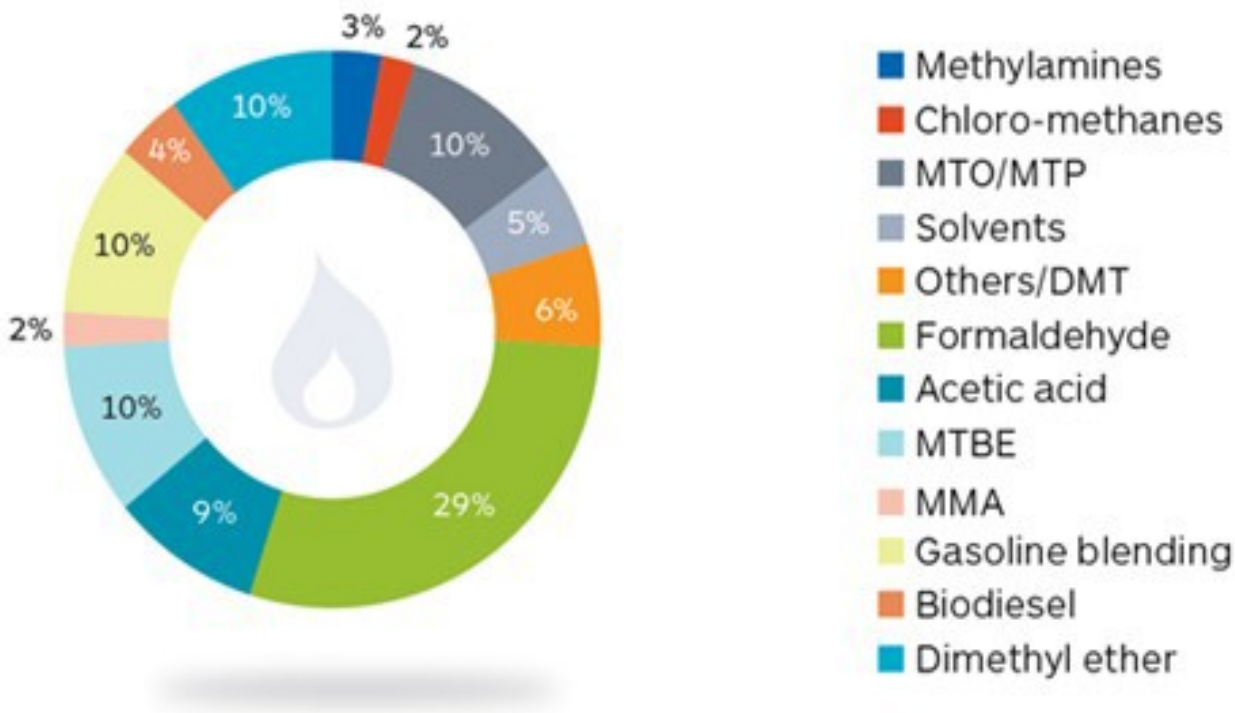
- **China** accounts for over 50% of the world's methanol production and consumption.

- **Methanol production markets include**:
  Azerbaijan, Brunei, China, Equatorial Guinea, Iran, Kingdom of Saudi Arabia, Malaysia, New Zealand, Oman, Russia, Trinidad & Tobago, United States, Uzbekistan

- **Significant new US capacity** in the coming years

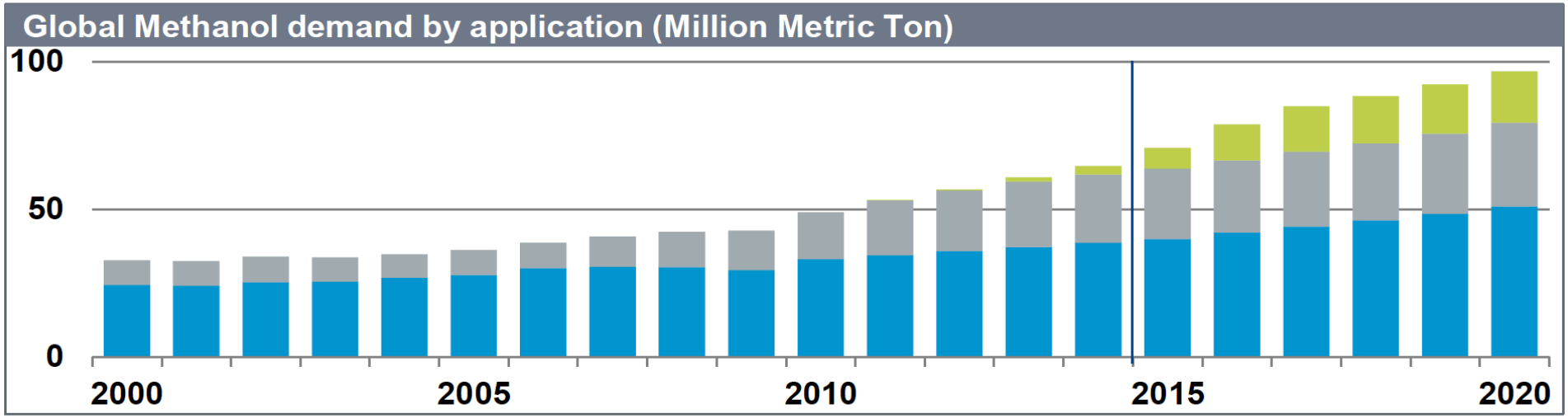
Source: IHS Markit, November 2016

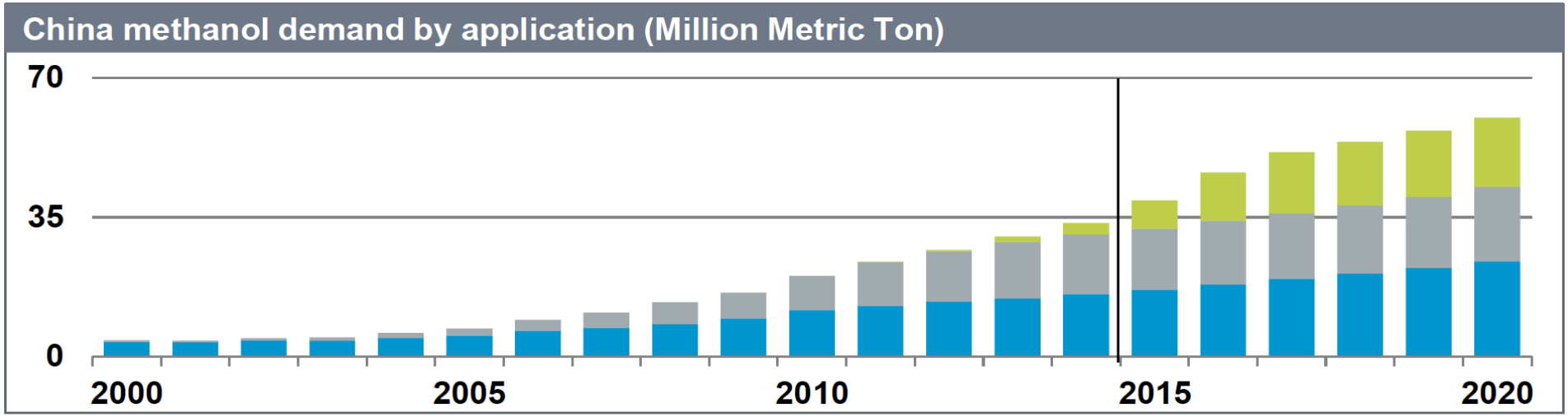
Global Methanol Chemical & Energy Demand



Source: IHS Chemical

Oil Displacement Drives Demand Growth





Traditional Derivatives | Fuel Applications | MTO / MTP

Source: IHS Chemical, November 2015

Methanol's Benefits

1. **Safe**
   - Methanol biodegrades quickly
   - Soluble in water
   - Can be washed off with soap/water
   - Harder to ignite than petrol, burns with 1/8 the heat

2. **Economical**
   - Economically competitive, non-subsidized
   - Produced from variety of feedstocks
   - Complex infrastructure, handling not needed

3. **Proven**
   - 74 MMT worldwide demand forecasted for 2016
   - 160,000 vehicles in China using methanol fuel
   - Stena *Germanica*, Methanex new-build tankers

03 METHANOL SAFETY

Product Stewardship – Top Priority

While accidents can happen, ***most of these incidents were preventable*.**

Understand methanol handling risks – mitigate those risks

Product stewardship: primary concern for MI & members

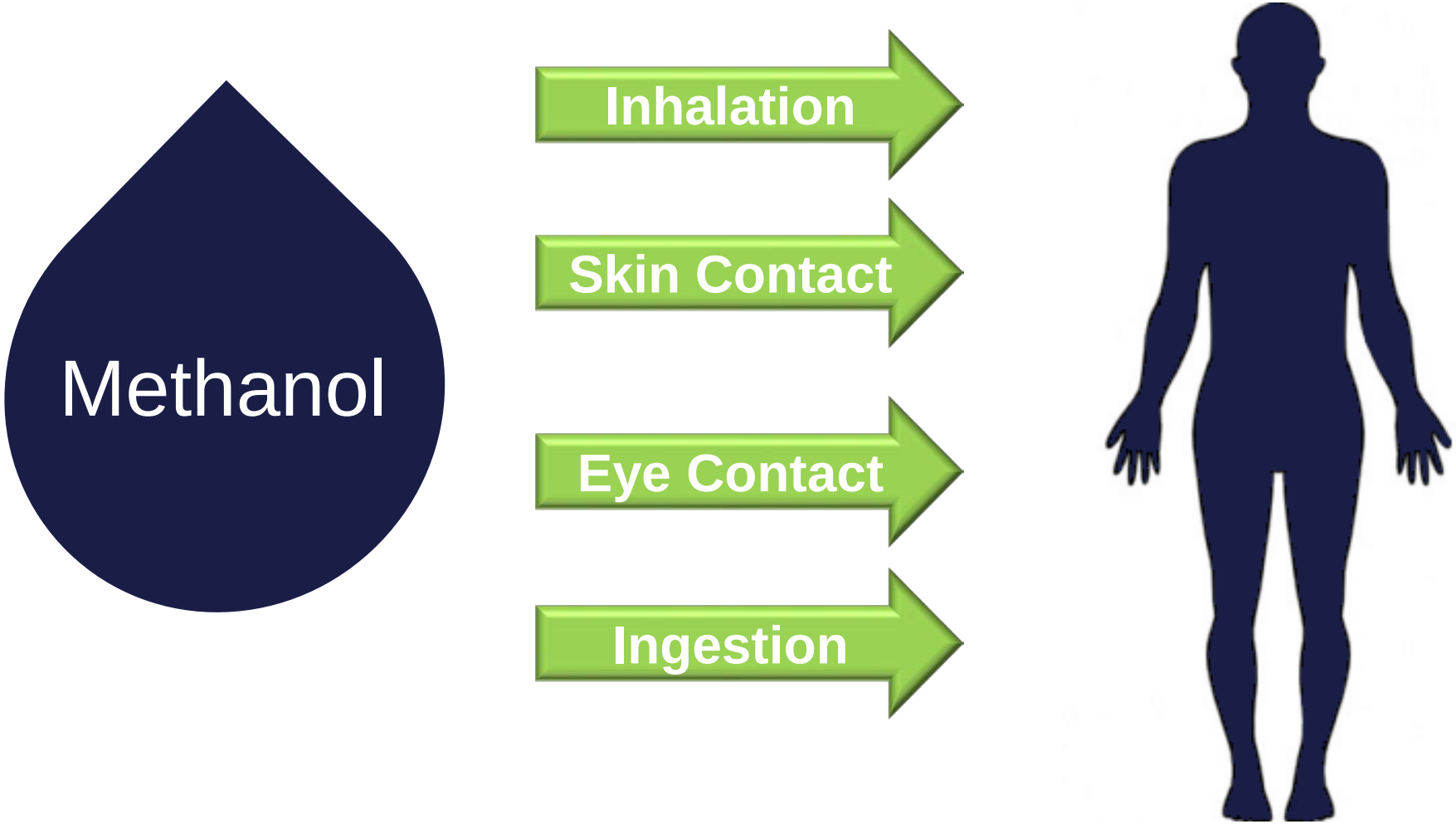
MI's methanol safe handling tools

Must Knows of Methanol

FLAMMABLE	BURNS WITH A CLEAR, LOW HEAT FLAME	DIFFICULT TO SEE DURING DAYLIGHT	IMPACT CONFINED TO SIZE OF SPILL
BIODEGRADES QUICKLY	SOLUABLE IN WATER	TOXIC	READILY ASORBED IN THE BODY

Managing the Health Risk

Four Routes into the Body



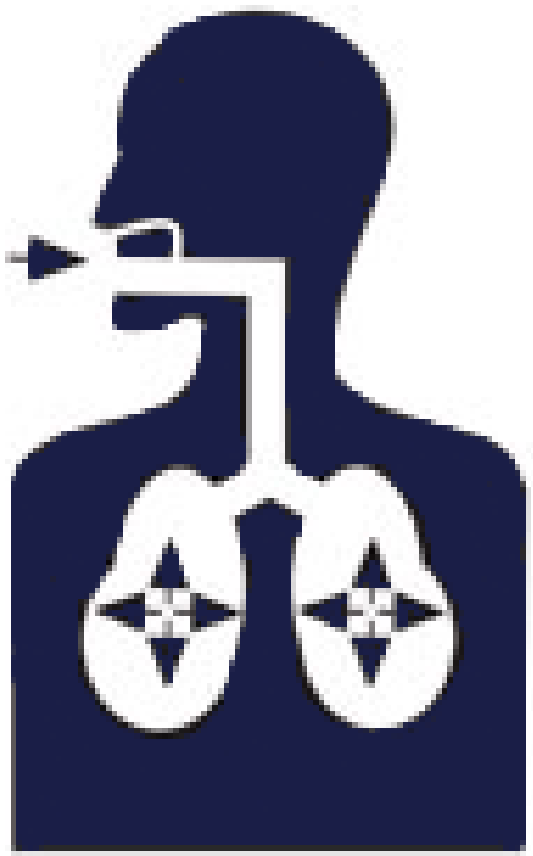
Managing the Health Risk

Treatment for Inhalation

Remove the person to fresh air- IF IT IS SAFE TO DO SO.

May require artificial respiration.

Obtain medical attention – possibility of delayed onset of symptoms.



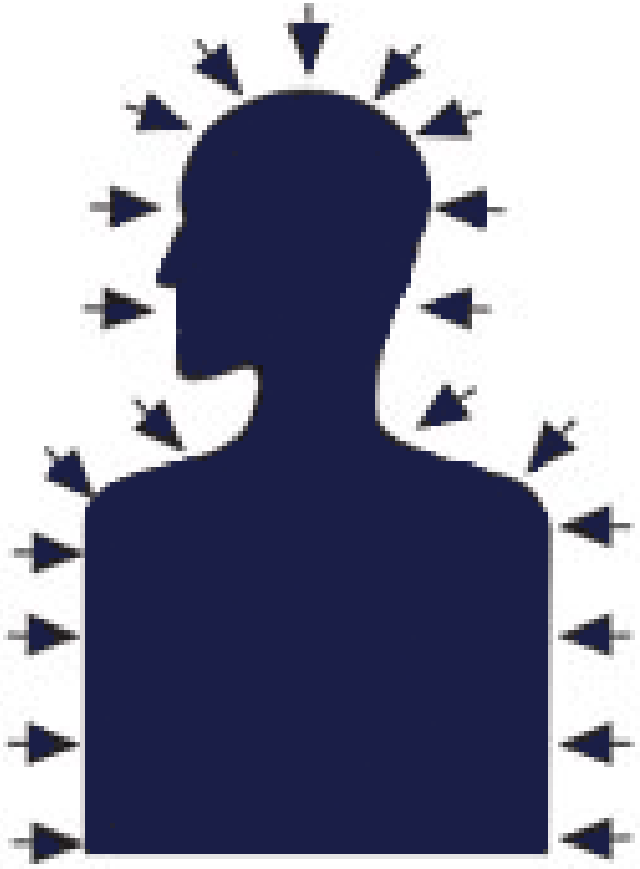
Managing the Health Risk

Treatment for Skin Contact

Remove clothing that is soaked with methanol; treat clothing as hazardous (flammable

Wash affected area with soap and water for 15 minutes.

If irritation occurs, seek medical attention



Managing the Health Risk

Treatment for Eye Contact

Immediately flush with gently running water.

Continue for at least 15 minutes

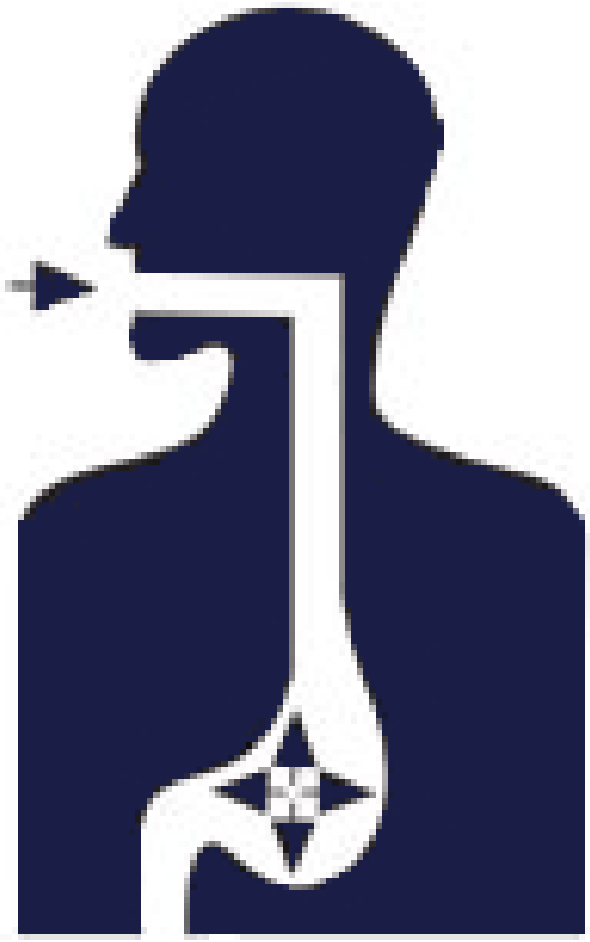
Ensure all surfaces and crevices are flushed by lifting upper and lower eyelids.

Obtain medical attention.

Managing the Health Risk

Treatment for Ingestion

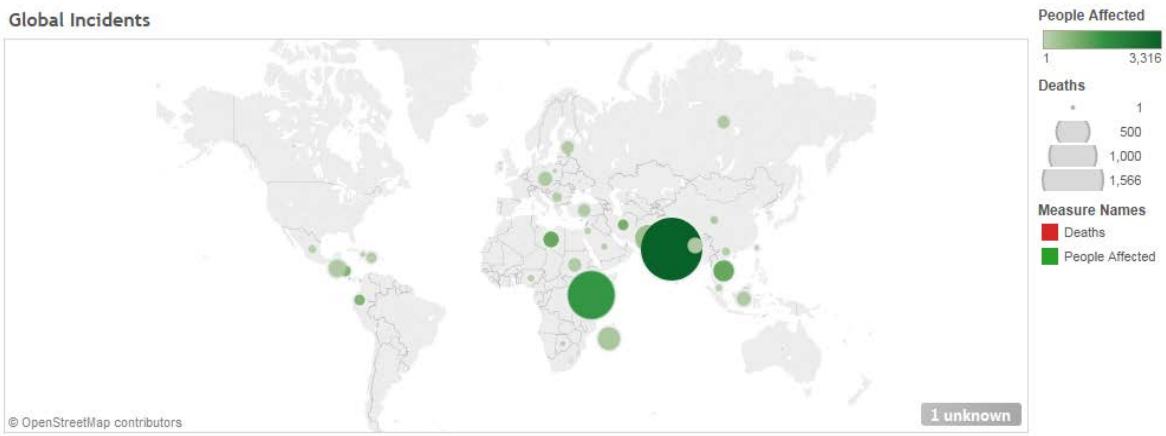
- Swallowing even small amounts of methanol can be life threatening.
- Onset of symptoms may be delayed for 18 – 24 hours
- Do NOT induce vomiting
- Obtain medical attention immediately
- Drinking ethanol blocks methanol metabolism
- Hospital injection of Fomepizole

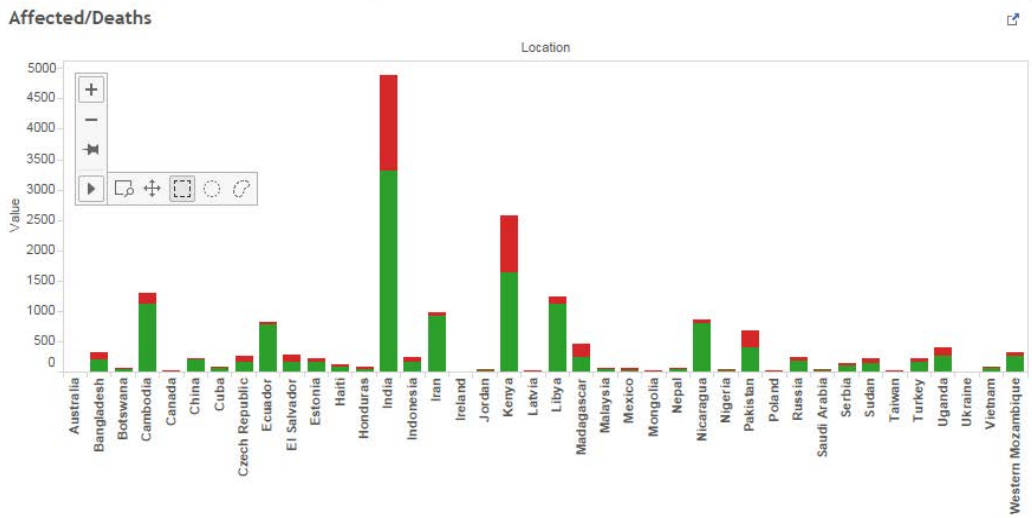


04 BOOTLEG ALCOHOL PREVENTION

Bootleg Alcohol Prevention

Bootleg Alcohol Poisoning is a Global Issue





Bootleg Alcohol Prevention

India Methanol Poisonings

- **Nearly 5,000 cases since 1992**
  1,500+ fatalities

Causes:

- High taxes and bans on alcohol
- Improperly-brewed alcohol
- Methanol-laced legitimate spirits
- Adulterated alcohol sold in legitimate packaging

Bootleg Alcohol Prevention

Symptoms

- Hyperventilation
- Visual disturbances, blindness
- Headache, vertigo
- Vomiting, abdominal pain
- Coma, Death

Onset of Symptoms can vary from 30 mins to 72 hours; average is 24 hours.

Bootleg Alcohol Prevention

Treatment Options

- 1. Fomepizole
- 2. Oral or IV Ethanol

Administer #1 or #2 immediately

- Duration of antidote: Give until 12-24 hours after dialysis is finished or until blood results are normal.

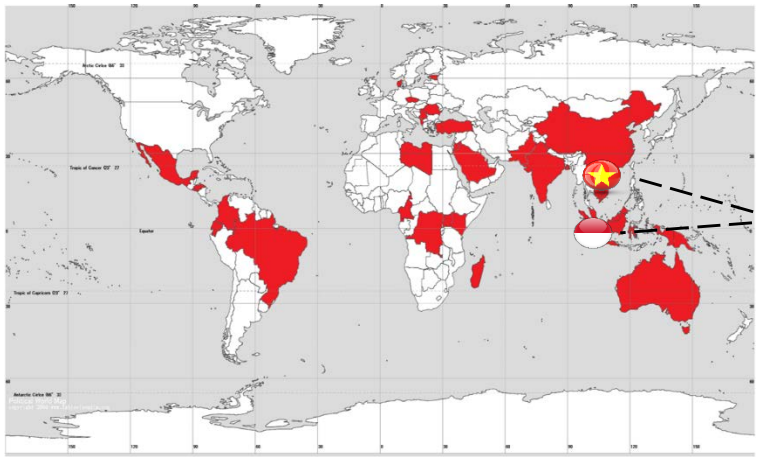
- 3. Dialysis (intermittent, high flow): give for least 6-8 hours;

Bootleg Alcohol Prevention

MI Bootleg Alcohol Prevention Subcommittee (BAPS) Mission

- Protect public health, mitigate incidences of global mass poisonings
- Mission: Develop sustainable, global pilot program
- Pillars: Community & medical education, law enforcement, government
- Indonesia programs began in 2013; Vietnam in 2016

BAPS Current Programs



Countries affected in last 10 years

METHANOL INSTITUTE

THE L.I.A.M CHARITABLE FUND
Lifesaving Initiatives About Methanol — 2013

TRƯỜNG ĐẠI HỌC Y HÀ NỘI
HANOI MEDICAL UNIVERSITY

BỆNH VIỆN BẠCH MAI
KHOA KHÁM BỆNH — 2016

MEDECINS SANS FRONTIERES

Oslo University Hospital — 2017

Bootleg Alcohol Prevention

Community & Medical Education Programs (CEP & MEP)

- CEP: Educate local communities about methanol poisoning
- MEP: "Train-the-trainer" programs for medical/healthcare workers
- Hanoi Medical University (HMU) research study in Phu Tho Province
- Govt: Relationship-building, training with health & law enforcement authorities

Bootleg Alcohol Prevention

Government & Law Enforcement

- Collaborate with political stakeholders, food safety departments
- Briefings for country travel boards
- Seek inclusion of poisoning training in medical school curricula

Bootleg Alcohol Prevention

Oslo University Hospital

MEDECINS SANS FRONTIERES

Apothecon Pharmaceuticals Pvt. Ltd. A Caring Company

University of St Andrews

STERIMAX INC.

Pharmaceutical & Technological Goals

- **Goal 1**: **Consumers:** Litmus dipstick test to check for methanol in beverages
- **Goal 2**: **Medical professionals**: Glucose-based, diabetes-like prick test
- **Goal 3**: **Technology**: Develop cheaper method for identifying alcohol content in unopened bottles
- **Goal 4**: **Pharmaceutical**: Make Fomepizole cost-affordable and widely available

Possible Areas for Collaboration

- Indian toxicology and poison control center professionals
- Identify collaboration opps with global partners
- Active data monitoring and response to at-risk locales
- Fomepizole & detection technology availability
- MI educational information dissemination

05 WE ARE HERE TO HELP

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