

# DAY 1

Keynote Forum



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Kenneth M. Haberman, J Environ Res, Volume 2

## FOUR DECADES OF ENVIRONMENTAL INVESTIGATION AND REMEDIATION OF CONTAMINATED PROPERTIES IN THE UNITED STATES —WHAT HAS CHANGED AND WHAT DOES THE FUTURE HOLD?

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There have been a number of changes regarding how contaminated properties are investigated and remediated the Comprehensive Environmental Response and Compensation Act, commonly referred to as Superfund, was passed in 1980. This paper discusses five of these fundamental changes and discusses how understanding the changes may help to identify how contaminated properties are investigated and remediated in the future:

1. The regulatory approach has changed from an enforcement-driven process to a voluntary, property transaction-based process. As a result, more properties have been investigated and remediated and the interaction between government agencies and the “regulated community” has improved.
2. The investigation and remediation process has changed as a result of the availability of published regulatory guidelines, industry standards and in particular numeric risk-based criteria. This process now often considers factors such as land use, sustainability, soil reuse and cross media impacts
3. The migration of soil vapor into buildings is now a common environmental concern in addition to impacts to soil and groundwater.
4. The opportunity for community involvement in the decision making process has changed as a results of the increased use of the internet and social media.
5. Funding and financing mechanisms have changed and now often rely on economic development-based financing and industry-specific reimbursement programs.

Government policies will continue to play a central role and the public will likely play an ever-increasing role as contaminated properties are investigated and remediated; however, the majority of investigation and remediation activities will likely continue to be the result of property redevelopment projects and real estate transactions. Adequate funding to address contaminated properties that do not present an opportunity for economic development will continue to be a challenge.

**Keywords** — environmental, investigation, redevelopment, remediation.

### Biography

Kenneth M. Haberman has over 35 years of experience specializing in the areas of environmental investigation and remediation and regulatory policy development. Ken served as the President of *Landmark Environmental, LLC* from 2000 to 2015. Ken is currently an Executive Vice-President. Ken is a former Board Chair of *Minnesota Brownfields*, a non-profit organization that promotes current brownfields initiatives. Prior to the establishment of Landmark, Ken was a Vice-President at *Barr Engineering Company*. Ken also worked for the *Minnesota Pollution Control Agency* for nearly sixteen years, primarily as a manager in the Voluntary Investigation and Cleanup Program and the Superfund Program. Ken has a Master’s Degree in Environmental Studies from Bemidji State University and a Bachelor’s Degree in Biology and Earth Science from the University of Minnesota. Ken participated in the Fellowship Program at the University of Minnesota, Humphrey Institute of Public Affairs in 1999 and 2000.

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## SOLID FUEL PRODUCTION FROM NON-SEGREGATED MUNICIPAL SOLID WASTES EMPLOYING THE HYDROTHERMAL TREATMENT

### Kunio Yoshikawa

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Up to now, the only commercialized ways of municipal solid waste (MSW) treatment are mass land-filling and mass burning. In Japan, most of burnable wastes are incinerated, but not in other countries, and still land-filling is the most popular way of waste treatment all over the world. But the world recent trend is to prohibit or limit land-filling of wastes while citizens do not want to increase waste incineration in developed countries as well as developing countries. On the other hand, major part of the world is discharging non-segregated municipal solid wastes. Thus we have to find out the utilization ways alternative to incineration for non-segregated MSW. Pre-treatment of wastes requires crushing, drying and deodorizing, which are normally different processes. But we have developed innovative hydrothermal treatment technology (HTT) which can perform these three pre-treatment functions in one process utilizing high pressure saturated steam. It shows the operating principle of HTT. Non-segregated MSW are fed into the reactor, and then, 220°C, 2.5MPa saturated steam is supplied into the reactor for about 30 minutes and the blades installed inside the reactor rotates to mix MSW and steam for about 10 minutes. Then the product is discharged after extracting steam. The product is powder-like substance and the moisture content is almost the same as

the raw material, but is easily dried by natural drying. The inert material such as metal, glass and stones can be easily sieved out after drying. There is almost no bad smell in the solid products, and the products can be used as solid fuels which can be easily mixed with coal for power generation or cement production. Only 10-15% of the product is enough for steam production in a boiler. HTT has already commercialized in Japan, China and Indonesia.

#### Biography

Kunio Yoshikawa is a Professor at Tokyo Institute of Technology and Associate Editor of *Applied Energy Journal*. He has completed his Bachelor's, Master's and Doctor degrees from Tokyo Institute of Technology. His major fields are Energy Conversion, Waste Management and Environmental Engineering. He has been working in Tokyo Institute of Technology for more than 38 years as a Research Associate, an Associate Professor and as a Professor. He has published nearly 200 journal papers with the major award of AIAA Best Paper Award, ASME James Harry Potter Gold Medal, JSME Environmental Technology Achievement Award and Best Educator Award of Tokyo Institute of Technology.

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# DAY 2

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## TURNING KNOWLEDGE INTO USEFUL ACTIONS

### Abdelhadi A W

Arabian Gulf University, Bahrain

**K**ofi Anan once said “knowledge is not lacking, what is lacking as ever, is the will to turn this knowledge into practice”. Two cases will be discussed one from North Africa and the other from Asia. The common factor is the will to turn knowledge into a motivation power to induce positive changes that could pave the way for innovation and sustainable development. The first case discusses how research results can be turned into innovation and community inspiration among dryland sorghum farmers in the vast central clay plains of Sudan. The initiative was a regional IDRC funded project to help farmers adapt to climate change in east and central Africa (Sudan, Ethiopia, Kenya and Tanzania). The successful research on micro water harvesting techniques has inspired young scientists to patent a Water Harvesting Inter-row Planter (WaHIP) that can make ridges plant sorghum in the bottom of the ridge in one operation that is carried out perpendicular to slope under heavy clay soils to prevent the scares rainfall water from running off the crop zone. The innovation had directed the attention of the government officials and the farmers. The results were overwhelming success with farmers trying to produce their own prototype of WaHIP, Government producing 4 WaHIP machines and a foreign company involved in mass production. The second case explains how cooperation between the Arabian Gulf University (AGU) through its unique

post-graduate programs and community service together with high level initiatives, decision makers and farmers can push constraints hindering agricultural development to its minimum limits. The cooperation between Bahrain National Initiative for Agricultural Development, AGU, the concerned Ministries and the farmers is highlighted to explore win-win situation for sustainable agricultural development. The results obtained so far were encouraging for more actions based on informed decisions supported by the political good will and inspiring leadership.

#### Biography

Abdelhadi A W has obtained his PhD in Global Science from Kobe University, Japan in 2000 where he spent two years in Postdoctoral studies. He obtained his MSc degree in Agriculture and Biological Science from the University of Newcastle upon Tyne in 1992. He worked for the Agricultural Research Corporation, Gezira Research Station for 22 years and as the Director of Soba Research Station for Saline & Sodic Soils. He worked for the Arab Organization for Agricultural Development before joining the Arabian Gulf University in 2011. He participated in more than 20 international conferences and workshops and published more than 29 papers in refereed prominent journals and is serving as a referee for more than five reputable scientific journals.

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## PERFORMANCE EVALUATION OF VARIOUS PV MODULES TECHNOLOGIES IN POLAND

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**D**ue to human population growth, spreading of technology and consumption rise the energy demand of our civilization increased rapidly during last decades. The depletion of fossil fuels forces us to develop new alternative energy sources. Among them solar radiation has the largest potential which can be utilized in the process of photovoltaic conversion which provides the most useful energy form, electric energy. The aim of the presented work is to compare different photovoltaic (PV) technologies performance under real operation conditions in East part of Poland (warm summer continental climate according to Köppen's climate classification). The study is based on the data collected during 2015-2016 period at photovoltaic plant which consists of polycrystalline modules (1390 kWp of nominal power) as well as thin film CdTe, amorphous silicon and copper indium gallium (di)selenide (CIGS) modules (3.3 kWp, 3.42 kWp, 3.72 kWp, respectively). Simultaneously with monitoring of energy production at the PV plant, measurements of solar irradiation and module temperature was carried out by adequate sensors and all the received data were registered every five minutes during the considered period of time. The results show that monthly yield as well as performance ratio of CIGS modules is good comparing to other installed technologies, especially during summer months. The significant impact of temperature is visible in case of pc-Si in contrast to CIGS technology which has the lowest temperature related loses. Prediction of performance and assessment of diverse PV technologies in the given location are significant and allow avoiding over or under estimation of installations at the planning stage.



### Recent Publications

1. Zdyb A and Krawczyk S (2010) Molecule-solid interaction: Electronic states of anthracene-9-carboxylic acid adsorbed on the surface of TiO<sub>2</sub>. *Applied Surface Science* 256:4854-4858.
2. Krawczyk S and Zdyb A (2011) Electronic Excited States of Carotenoid Dyes Adsorbed on TiO<sub>2</sub>. *Journal of Physical Chemistry C* 115:22328-22335.
3. Zdyb A and Krawczyk S (2014) Adsorption and electronic states of morin on TiO<sub>2</sub> nanoparticles. *Chemical Physics* 443:61-66.
4. Zdyb A and Krawczyk S (2016) Characterization of adsorption and electronic excited states of quercetin on titanium dioxide nanoparticles. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 157:197-203.

### Biography

Agata Zdyb has received her PhD in 2002 from Gdansk University of Technology in Poland. She has completed her Habilitation degree from AGH University of Science and Technology in 2012, with her thesis titled as "The research on the improvement of dye-sensitized solar cells efficiency". She is the Head of the Institute of Renewable Energy Engineering at Lublin University of Technology, Poland. She is an author and co-author of more than 70 publications in international and Polish journals and conference contributions. Her scientific topics of interest are: thin film solar cells, dye-sensitized solar cells (DSSC), photovoltaic systems, organic dyes for applications in DSSC, renewable energy sources, nanotechnology.

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