

Material Disclosure

Management of Key Material Aspects in 2024

RATCH's commitment to environmentally- and socially-responsible operations reflects in the emphasis on the management of likely negative impacts from all activities at its best. Subsidiaries and joint ventures are instructed to ensure safety, taking into account stakeholders, community, society and the environment. RATCH has outlined the management approach, measures and tools in both enterprise and project levels, to prevent, control and mitigate negative impacts as best as possible, while addressing the concerns of stakeholders particularly neighbouring communities. Meanwhile, the Company is pushing forward the activities that generate positive impacts for the benefits of stakeholders, community, society and the environment.

The management approach for the material topics in 2024 is summarized below:

Topics	1) Safety of stakeholders from power p	plants' operations
	2) Protection of Labor's safety and occ	cupational health
Impacts	 RATCH and its power plants' operations main impacts on community. Community is concerned about possible da operations. Work-related hazards due to inappropriate employees, suppliers and contractors. 	inger from RATCH and its power plants'
Supervision	RATCH Group Legal requirements Code of Conduct Environmental and Social Policy Human Rights Policy Environmental and Social Management System (ESMS) and ESMS Committee Supplier Code of Conduct Safety, Occupational Health and Working Environment Policy Emergency Response Plan, Crisis Management Plan and Business Continuity Plan Policy	Project Level Environmental and social impact prevention and mitigation measures as prescribed in EIA/EHIA reports Environmental and Social Policy Safety, Occupational Health and Working Environment Policy Safety and occupational health measures and Emergency Response Plan Work safety risk assessment system



- Safety, Occupational Health and Working Environment Committee
- Internal Audit Department
- Business Development and Asset Management Functions
- Risk Management Working Committee
- Risk Management Committee
- Audit Committee
- Corporate Governance and Sustainability
 Committee
- Board of Directors
- Risk management system and project performance reporting
- Complaint channel

- Environmental management standard (ISO 14001) and occupational health management standard (OHSAS 45001)
- Environmental, safety and occupational health section
- Safety, Occupational Health and Working Environment Committee
- Tri-Partite Committee consisting of community/civil society/government/ project representatives
- Joint ventures' board of directors (with RATCH's representatives)
- Communication and complaint channel,
 Community Relations Division, and
 community development plans

- Select and install high-efficiency production technology and systems for environmental quality and safety management in the development phase, while each power plant is equipped with air quality monitoring systems and the systems to monitor water quality inside and outside operational premises.
- Apply the Environmental and Social Management System (ESMS) as a tool in assessing risks and monitoring the Company and project-level safety operations.
- Monitor the compliance of the safety, occupational health and environment operations of all projects with EIA measures, environmental and safety laws, the Code of Conduct, relevant safety and environmental policies and the Human Rights Policy; report the performance to the Management, the Board of Directors and relevant government offices within specified periods; conduct an internal audit; and comply with legal requirements on information disclosure.
- Encourage power plants' adoption of internationally-recognized environmental and safety management systems and certification by external experts.
- Ensure all power plants' risks are assessed to indicate possible hazards and severity; establish control measures to keep risks in line with risk appetite; and always have the responsible units and safety professionals monitor risk jobs.
- Allow the tri-partite committee's inspection at each power plant and hear the views and recommendations
 for joint discussions on improvements that best address community expectations and concerns.
- Establish community relations units, to disclose information, clarify issues of concern and build engagement with community.



- Provide a mobile medical unit to monitor community members' health conditions.
- Conduct emergency response drills with participation of community and relevant parties, for their confidence and trust in power plants' safety operations.
- Organize annual activities to raise awareness in safety and health among employees, suppliers and community.
- Ensure power plants establish an accessible communication system and channel for community and notify community ahead of major activities.

Additional measures for employees and suppliers

- Ensure work safety with the Stop Work Authority and the right to refuse dangerous work in light of physical unfitness or unsafe work conditions.
- Provide annual medical examination and special examination for particular jobs that pose particular risks; and a stress relief program for employees with Biofeedback mental and physical health checkup.

- Support community development activities and remediate those affected by power plants' operations
 through the Power Development Funds. All power plants, IPP and SPP, are obliged to contribute to the
 funds on an annual basis.
- Tackle emergency or incidents timely and efficiently to quickly recover to the normal conditions; and set the remediation measures for employees, suppliers and community affected by the incidents that shall be at least equivalent to legal requirements.
- Assess the effectiveness of Prevention and Control Measures and equipment after the incidents to improve the safety conditions and establish additional measures to prevent the repetition.

Target	Zero accident every year	
	No complaint from community	
Engagement	Environmental Inspection Committee/Tri-partite Committee	
channels	• Community relations units, communications channels, and community development	
	activities/projects	
	Company website: www.ratch.co.th	
	Channels open to the opinions and complaints of power plants or projects	
	Safety, Occupational Health and Working Environment Committee	
	Welfare Committee	
	Complaint channel for job operators	
	Departmental and functional relationship-building activities	
	Discussions and meetings	
	Training sessions/seminars on ESG operations and supplier assessment	



Topic	3) Management of air pollution and health impacts on community	
Impacts	Community's concerns about the impact of power plants' combustion-related air pollution on	
	their health condition	
Supervision	RATCH Group	Project Level
	Legal requirements	Power plants' board of directors (with
	Environmental and Social Policy	RATCH's representatives)
	Human Rights Policy	Environmental and social impact
	Environmental and Social Management	prevention and mitigation measures as
	System (ESMS)	prescribed in EIA/EHIA reports
	Business Development and Asset	Continuous Emission Monitoring System
	Management Functions	installed at stack and around the power
	Risk Management Committee	plants.
	Corporate Governance and Sustainability	Online reports of monitoring results to the
	Committee	control room and the power plants' display
	Board of Directors	at entrance
	Complaint channel	Environmental management standard
		(ISO14001) for power plants
		Production efficiency control and
		environmental units
		Community Relations Division
		Tri-Partite Committee
		Complaint channel and complaint handling
		procedure

- Design, select and install high-efficiency air quality management technologies in the development stage, to minimize and keep impacts within permissible levels. The technologies include Dry Low NO_x burners and demineralized water injection to control nitrogen oxide when diesel is used for power generation; Flue Gas Desulfurization (FGD) when fuel oil is used; and Continuous Emission Monitoring (CEM) for air quality monitoring.
- Set up a warning system for unusual pollutant levels approaching permissible limits.
- Monitor the ambient air quality in sensitive or community areas around the clock or as scheduled.
- Monitor and inspect compliance with relevant laws, rules and regulations, EIA measures, financial
 institutions' terms and conditions, and corporate policies; and report the performance to relevant units as
 scheduled.



- Deploy the Environmental and Social Management System (ESMS) in assessing significant issues, the sufficiency of prevention and control measures, and the environmental and social operations of the Company and projects.
- Report real-time air quality monitoring results to the Department of Industrial Works and prepare monitoring reports for government offices and community every 6 months.
- Accommodate Tri-Partite Committee's inspection of air quality management system; consistently inform
 the committee of monitoring results; and welcome its recommendations and opinions as well as
 community's concern for the consideration of proper responses.
- Ensure power plants establish an accessible communication system and channel for community and notify community ahead of major activities that will affect the air quality like a fuel switch.
- Provide a mobile medical unit to monitor community members' health conditions.

- Support community development activities and remediate those affected by power plants' operations
 through the Power Development Funds. All power plants, IPP and SPP, are obliged to contribute to the
 funds on an annual basis.
- Set up a step-by-step procedure to deal with pollutants at stack when the levels hit 80% of legal limits, which may involve production reduction or production stop.
- Establish a complaint handling and correction procedure.

Target	No environmental complaints	
	No penalties on non-compliance with environmental laws/requirements	
Engagement	Channel to receive community opinions/complaints for further investigation and correction	
channels	Tri-Partite Committee	
	Activities to boost knowledge and understanding/Site visits	
	Community satisfaction survey	

Topic	4) Greenhouse gas management (Scope	e 1, 2, and 3 emissions)
Impact	Greenhouse gas emissions by the entire value chain	
Supervision	RATCH Group	Project Level
	Legal requirements	Board of directors (with RATCH's
	Environmental and Social Policy	executives)
	Corporate Sustainability Policy	Environmental and social impact
	Corporate Sustainability Strategy and	prevention and mitigation measures as
	Climate Strategy and relevant targets	prescribed in EIA/EHIA reports as well as
		creditors' terms and conditions



- Environmental and Social Management System (ESMS)
- Business Development and Asset
 Management Functions
- Corporate Governance and Sustainability Committee
- Board of Directors

- Environmental management standard (ISO14001) concerning power plants
- Production efficiency control and environmental units
- · Community Relations Division
- Tri-Partite Committee

- Design, select and install high-efficiency air quality management technologies to minimize fuel and energy utilization; and conduct power plant maintenance as scheduled.
- Set the 2050 Carbon Neutrality Target and Decarbonization Roadmap, focusing on enhanced energy
 efficiency, more investment in renewable energy and low-carbon businesses, and carbon offsetting with
 carbon credits from reforestation and forest conservation activities.
- Plan maintenance as scheduled for the efficiency of equivalent availability factor and targeted heat rate.
- Reuse/recycle waste as much as possible and avoid landfill disposal.
- Assess physical and transit risks as well as impacts under the TCFD framework and use the results for the formulation of corporate strategies as well as measures to prevent, reduce and avoid the impacts.
- Include the assessment of supplier risks on greenhouse gas management in the supplier screening process.
- Promote green procurement to tackle and reduce other indirect emissions.
- Conduct a feasibility study on green hydrogen development in preparation for the energy transition.
- Prepare the Company Group's greenhouse gas inventory covering Scope 1, 2 and 3 emissions; and run the carbon footprint for organization assessment.
- Set internal carbon pricing for the investment consideration process or the implementation of GHGreduction activities.
- Implement forest carbon credit under T-VER: Forestry and Green Space program in support of GHG sequestration and carbon offsetting.
- Disclose the information on carbon emissions annually in Form 56-1 One Report and Sustainability Report.

Correction/Remediation

- Follow the Company's prescribed processes.
- Comply with legal requirements.

Targets

- Carbon neutrality in 2050
- 15% reduction of GHG emissions per unit of electricity production in 2030 (from the base year 2015)
- Proportion of renewable energy investment raised to 30% of combined capacity in 2030



Engagement	Corporate website
channels	Sustainability Report
	Corporate Affairs Department
	Investor Relations Division

Topic	5) Changes in community quality of life a	after power plant establishment
Impacts	Changes in community way of life/careers due to higher population	
	Migration into the community, leading to insufficient resources	
Supervision	RATCH Group	Project Level
	Code of Conduct	Board of Directors (with RATCH's
	Environmental and Social Policy	representatives)
	Human Rights Policy	Environmental and social impact
	Environmental and Social Management	prevention and correction measures as
	System (ESMS)	prescribed in each project's EIA/EHIA
	Business Development and Asset	reports
	Management Functions	Environmental management standard
	Corporate Governance and Sustainability	(ISO14001)
	Committee	Community Relations Division
	Board of Directors	Tri-Partite Committee

- Conduct a public hearing and prepare a local/community development plan as part of the environmental and social impact assessment and analysis process, in the development phase.
- Monitor and ensure compliance with laws and EIA measures in the construction phase, particularly concerning the operations of suppliers and contractors on the sites.
- Implement quality of life development projects in line with community needs, like career development for more income as well as education, religious, cultural and health service supports.
- Prioritize local workers employment and product procurement from local suppliers.
- Make contribution to the Power Development Funds in support of the development of communities surrounding the power plants and vicinity.
- Conduct a community opinion survey.

Correction/Remediation

• Channel to hear community opinions and complaints, for further investigation and correction.



The Power Development Fund, to support community development and remediate those affected from the
power plants' operations. All power plants are obliged to contribute partial revenue to the fund on an annual
basis.

basis.		
Targets	No community complaint	
	Level of community satisfaction	
Engagement	Scheduled opinion surveys	
channels	Community development activities	
	Community visits for building engagement	
	Channel to receive community complaints and prevention/correction measures	

Topic	6) Business ethics	
Impacts	Non-compliance with relevant laws and requirements	
	Lack of transparency and fairness in the operations	
Supervision	Legal requirements	
	Code of Conduct	
	Anti-Fraud and Corruption Policy	
	Corporate Sustainability Policy	
	Supplier Code of Conduct	
	Corporate Governance Policy	
	Prevention of Misuse of Inside Information Policy	
	Audit Committee	
	Risk Management Committee	
	Corporate Governance and Sustainability Committee	
	Internal Audit Department Internal Audit Department	
	Sustainable procurement	

Prevention and correction measures

- Comply with laws, corporate governance practices, and the anti-corruption policy and regulation; and join Thai Private Sector Collective Action Against Corruption.
- Assess fraud and corruption risks for the annual review of the risk register and control measures.
- Apply sustainable procurement practices in supplier screening, by assessing ESG risks and critical suppliers; and monitor each supplier's compliance with Supplier Code of Conduct.
- Communicate to employees and make them see the need to strictly comply with the Company's Code of Conduct and rules concerning use of internal information and confidential information; and evaluate their



knowledge and understanding through an annual test of which results are forwarded to the Board of Directors.

Correction/Remediation

- Establish the complaint-receiving, investigation and remediation procedure as well as protection measures for complainants.
- Set penalty clauses depending on the severity of incidents/damage to the Company.
- Proceed in line with relevant legal requirements.

Targets	No legal issues/disputes	
	No punishment/penalties from legal non-compliance	
	No complaint	
Engagement	Complaint channel on corporate website: www.ratch.co.th	
channel		

Topic	7) Power plants' wastewater management	
Impact	Power plants' water discharge may affect the quality of water in public waterways and how	
	communities use the water.	
Supervision	RATCH Group	Project Level
	Environmental and Social Policy	Board of Directors (with RATCH's
	Environmental and Social Management	representatives)
	System (ESMS)	Environmental and social impact
	Business Development and Asset	prevention and correction measures as
	Management Functions	prescribed in each project's EIA/EHIA
	Corporate Governance and Sustainability	report
	Committee	Legal requirements
	Risk Management Committee	Environmental management standard
	Board of Directors	(ISO14001)
		Environmental office
		Tri-Partite Committee
		Community Relations Division

Prevention and Control Measures

- Select and install treatment systems for each type of wastewater in the project development phase as prescribed by laws; and maintain the efficiency throughout the project's life cycle.
- Apply the environmental and social management system (ESMS) and environmental management standard (ISO 14001), to meet legal and universal requirements on water discharge.



- Install the online water discharge monitoring system, for consistent reporting to the governing body.
- Examine the quality of wastewater and water at discharge points, above and below the points, to watch out for the impacts on water quality, living organisms and public water use; and report the results to the governing body as scheduled.
- Ensure complete compliance with environmental laws and EIA/EHIA measures and consistently report the compliance results to relevant business units as well as the community.

- Increase the water cycles in cooling tower, to reduce the volume of discharge.
- Promote the improvement of water quality in public waterways where wastewater is discharged, through community development activities.
- Accommodate Tri-Partite Committee's participation in the water quality monitoring process at all points and inform it of monitoring results.
- Establish a complaint channel as well as the fact-finding and results-reporting process.

Target	No environmental complaint	
	No penalties from non-compliance with environmental laws/requirements concerning	
	effluent quality	
Engagement	Channel to receive community opinions/complaints for further investigation and	
channels	correction	
	Environmental Inspector Committee/Tri-Partite Committee	
	Activities to boost knowledge and understanding/Site visits	
	Community opinion survey	

Topic	8) Changes to ecosystems after power p	plant construction
Impacts	Modification of the site or land use for the construction	
	Physical and biological impacts of pollutant	t emissions
Supervision	RATCH Group	Project Level
	Legal requirements	Board of Directors (with RATCH's
	Environmental and Social Policy	representatives)
	Environmental and Social Management	Legal requirements
	System (ESMS)	Environmental and social impact
	Business Development and Asset	prevention and mitigation measures as
	Management Functions	prescribed in EIA/EHIA reports
	Risk Management Committee	



 Corporate Governance and Sustainability 	,
Committee	

- Board of Directors
- Complaint channel

- Measures as prescribed in the Biodiversity Action Plan (BAP)
- Environmental management standard (ISO14001) concerning power plants
- Environment Division
- Community Relations Division
- Tri-Partite Committee
- Complaint channel and handling procedure

- Do not locate projects in the areas that may pose high risks and impacts on historical or world heritage sites or areas that may affect rare and near-extinction living beings, based on the IUCN's Red Lists.
- Survey the construction site and analyze the impacts on ecosystems and biodiversity, as part of the environmental and social impact assessment in the project development phase; outline prevention and mitigation measures or a biodiversity action plan.
- Ensure the complete implementation of measures in EIA/EHIA reports and/or the Biodiversity Action Plan.
- Apply the Environmental and Social Management System's Biodiversity Management Procedure as the guidelines for impact assessment and the Biodiversity Action Plan (BAP) development.
- Monitor plant and animal species, density and diversity as prescribed to assess the effectiveness of impact prevention and mitigation measures; introduce additional measures to restore the ecosystem; and report the results to relevant governing offices and community.

- Adopt the Mitigation Hierarchy principles as guidelines to prevent risks to biodiversity and restore biodiversity at all projects.
- Accommodate Tri-Partite Committee's participation in site inspection; inform it of biodiversity inspection results; and welcome its opinions.
- Promote terrestrial and mangrove reforestation and green areas as well as community forest conservation.

Targets	• Unchanged biodiversity in the ecosystems or positive changes to the ecosystems, both
	inside and outside the construction sites.
	 Forest areas and carbon sequestration capacity in line with targets
Engagement	Channel to receive community opinions/complaints
channels	Environmental Inspectors Committee/Tri-Partite Committee/working committees



Topic	9) Power plants' water management and	reduction of water usage
Impact	Massive water utilization in the production process may lead to water shortages and fight for	
	the resource	
Supervision	RATCH Group	Project Level
	Legal requirements	Board of Directors (with RATCH's
	Environmental and Social Policy	representatives)
	Environmental and Social Management	Environmental and social impact
	System (ESMS)	prevention and mitigation measures as
	Corporate Governance and Sustainability	prescribed in each project's EIA/EHIA
	Committee	report
	Risk Management Committee	Legal requirements
	Board of Directors	Environmental management standard
		(ISO14001)
		Environment Division
		Tri-Partite Committee
		Community Relations Division

- Study water usage as part of the development phase's environmental impact assessment; and establish preventive and mitigative measures for implementation throughout the contract periods of power plant projects.
- Monitor the compliance with laws; the Company's policies, regulations and rules; and EIA measures; and report the monitoring results to relevant units.
- Apply Environmental and Social Management System (ESMS) as a tool to assess wastewater management risks in both development and operational phases; and monitor the implementation of prescribed measures.
- Assess the risks and stress level of raw water sources that the power projects depend on, to evaluate the necessity of supplementary sources.
- Assess seasonal water demand/availability so as not to cause shortages and spark fight for water with community and impacts on the ecosystem; and appropriately determine the operating plan.
- Prepare rainwater-retention ponds to reduce raw water withdrawal.
- Monitor water consumption and the ratio of withdrawals and the volume of available raw water, as
 prescribed in the EIA/EHIA reports.
- Maximize raw water utilization per power unit.
- Increase water cycles in the cooling tower, to reduce raw water withdrawals.

Correction/Remediation

Find supplementary water sources to ensure smooth operations (in emergency cases).



• Treat water from the cooling system, after sedimentation and pH balancing, with RO treatment system to		
recover wat	recover water for the production process.	
Target	No environmental complaint	
	No penalties from non-compliance with environmental laws/requirements	
	Water cycles in the cooling system meeting each power plant's target	
Engagement	Channel to receive community opinions/complaints	
channels	Environmental Inspectors Committee /Tri-Partite Committee/working committees	
	Activities to boost knowledge and understanding/Site visits	
	Disclosure of operational performances via corporate public relations channels	
	Sustainability Report	

Topic	10) Heat released from power plants	
Impact	Community concerns about combustion heat released to the atmosphere and hence raising	
	temperature	
Supervision	RATCH Group	Project Level
	 Environmental and Social Policy 	Project's board of directors with RATCH's
	Environmental and Social Management	representative
	System (ESMS)	Environment Division
	Risk Management Committee	Community Relations Division
	Corporate Governance and Sustainability	Environmental and social impact
	Committee	prevention and mitigation measures as
	Board of Directors	prescribed in each project's EIA/EHIA
		report

- Study and collect the temperature statistics at the project sites and nearby areas to indicate any changes; and monitor updates on global climate change.
- Always maintain equipment insulation in a good and efficient condition.
- Monitor the land surface temperature data from satellite images to examine the pattern of heat moving out from the project sites to nearby areas.
- Consistently visit community members and other parties during when Community Relations Division communicates and gives information on the power plants' operations.

Correction/Remediation

• Accommodate Tri-Partite Committee's visit to inspect the power plant's operations and express opinions.



- Open for the visits by educational institutions, community and others, to observe the operations and environmental management as prescribed in EIA/EHIA.
- Make contributions to the Power Development Fund, which can be used to remediate those affected by power plants' operations.
- Establish a complaint channel.

Target	No environmental complaint
	No penalties from non-compliance with environmental laws/requirements
Engagement	Channel to receive opinions/complaints
channels	Environmental Inspectors Committee /Tri-Partite Committee
	Community Relations Division

Topic	11) Data security threats from cyber attacks
Impact	Leakage of confidential information and personal data
Supervision	Code of Conduct
	Network and Computer Usage Policy
	Information Technology Security Policy
	Personal Data Protection Policy
	Information technology office
	Internal Audit Department
	Risk Management Committee
	Corporate Governance and Sustainability Committee
	Board of Directors

- Monitor and inspect compliance with the Network and Computer Usage Policy, the Information
 Technology Security Policy, and the Personal Data Protection Policy; and report the results to relevant
 offices.
- Set up firewalls against cyberattacks and unauthorized access and have external experts test the system efficiency and effectiveness.
- Schedule an assessment on risks and likelihood, concerning the technical and personnel aspects as well
 as emergency situations.
- Provide safety devices for the connection with the network.
- Exercise cyberattack drills concerning the information technology system and network.

Correction/Remediation

Prepare the Business Continuity Plan (BCP) and the IT Disaster Recovery Plan (IT-DRP).



Exercise emergency response drills in preparation for cyber threats or cyberattacks.		
Define the steps/procedure to tackle the leakage of confidential information and personal data.		
Target	Zero leakage of confidential information and personal data	
	No complaint on cyber crimes	
Engagement	Complaint channel on corporate website: www.ratch.co.th	
channel		

Topic	12) Inability to meet customer's product quantitative terms	requirements in qualitative and
Impact	Customers are delivered products or services requirements.	s which are sub-standard or do not meet their
	requirements.	
Supervision	RATCH Group	Project Level
	Code of Conduct	Power plant's board of directors with
	Business Development and Asset	RATCH representative
	Management Functions	Production/customer relations sections
	Risk Management Committee	Contract management section
	Board of Directors	

- Set up the contract management section to ensure products and services are properly produced and delivered to customers as prescribed in the terms and conditions.
- Communicate, discuss and coordinate with customers concerning the terms and conditions.
- Plan the production/maintenance properly to maintain the power plants' equivalent availability factor (EAF) and heat rate as prescribed by the power purchase agreements.
- Seek solutions for reducing fuel/resource utilization, and keep carbon emission intensity per power unit low for competitiveness.
- Define the customer relations strategy and targets and survey the satisfaction of each customer for further improvements and better responses to customer demands.

- Source more renewable energy for internal use to reduce customers' carbon footprints or emission intensity per power unit.
- Coordinate with customers and support their installation of solar rooftops, to help reduce their Scope 2 emissions.

Target	Customer satisfaction
	No environmental complaint



Engagement	Communication channel
channels	Customer satisfaction survey form
	Scheduled meetings with customers/ engagement activities

Topic	13) Exploitation of competitors' confidential information for business gains
Impact	Unfair bidding
Supervision	Code of Conduct
	Anti-Fraud and Corruption Policy
	Business Development, Asset Management, and Accounting & Finance Functions
	Internal Audit Department
	Corporate Governance and Sustainability Committee
	Audit Committee
	Risk Management Committee
	Board of Directors

- Communicate and make employees aware of the necessity in strictly complying with the Code of Conduct concerning the treatment of competitors, as well as the policies and regulations of anti-fraud and corruption and conflict of interest.
- Ensure all employees' acknowledgement of the employment confidentiality conditions.
- Have the anti-fraud and corruption risk register evaluated/reviewed by the Internal Audit Department/external experts.
- Evaluate/test employees' understanding in the anti-fraud and corruption guidelines on an annual basis.

- Clearly define the investigation mechanism for incidents/complaints as well as corrective measures.
- Impose the penalties on violation or the use of competitors' confidential information for the Company's or personal benefits.

Target	No legal issues/disputes
	No complaint
Engagement	Complaint channel and prevention/correction procedure
channels	